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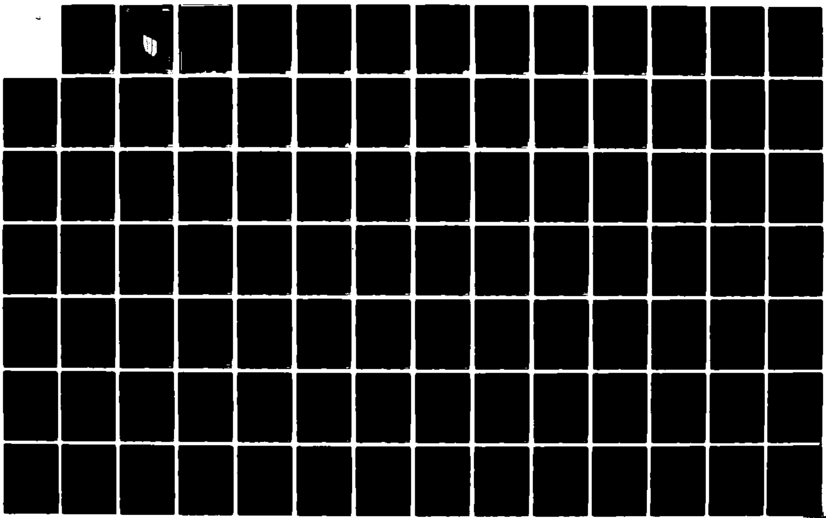

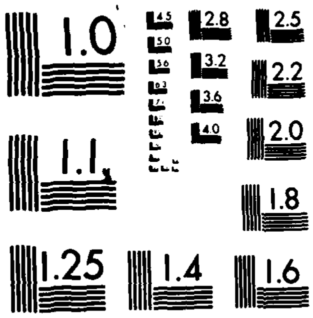

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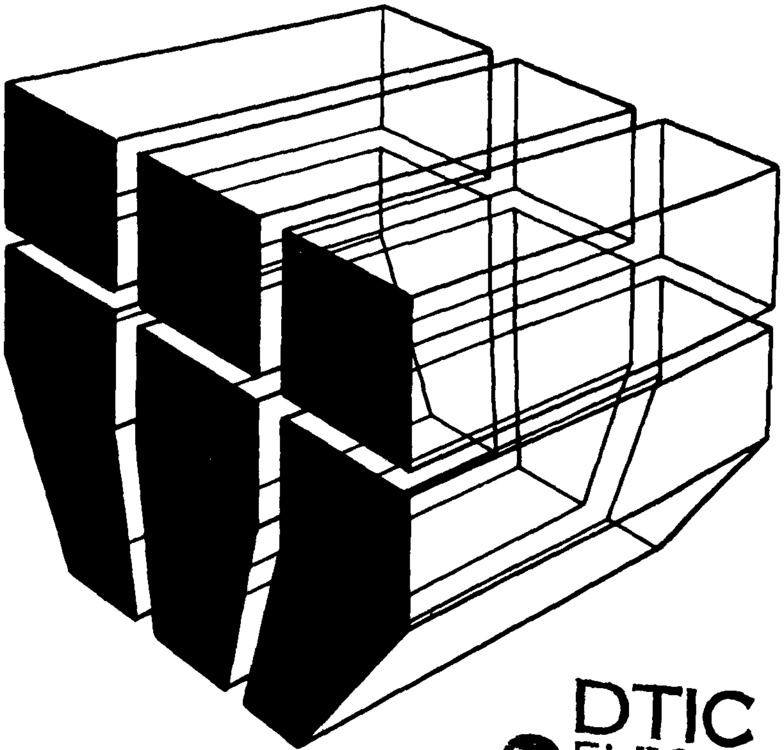
January 1984

USER MANUAL FOR DRIVER PROGRAM



by
Barbara Swain
David Effland

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NOISEMAP3.4 computer program efficiently computes the noise level of aircraft, which is one step in the determination of the noise impact created. DRIVER is a program that will simplify the use of NOISEMAP3.4 when evaluating simple rectangular flight patterns. This manual was designed to guide the reader in using the DRIVER program. DRIVER takes a more general description of the flight pattern and computes the necessary input for NOISEMAP3.4. This manual uses the helicopter training flight patterns as examples.

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FOREWORD

This work was performed for the Department of Transportation, Federal Aviation Agency, under reimbursable order no. DTFA 0183Y-10543, by the Environmental Division (EN) of the U.S. Army Construction Engineering Research Laboratory (CERL).

Dr. R. K. Jain is Chief of CERL-EN. COL P. J. Theuer is the Commander and Director of CERL, and Dr. L. R. Shaffer is Technical Director.

CONTENTS

USER MANUAL FOR DRIVER PROGRAM

1 INTRODUCTION

Background

The Department of Defense has long been concerned about the noise impact of military airfields on the surrounding area. NOISEMAP 3.4[1] computer program efficiently computes the noise level of aircraft, which is one step in the determination of the noise impact created. DRIVER is a program that will simplify the use of NOISEMAP3.4 when evaluating simple rectangular flight patterns.

DRIVER takes a more general description of the flight pattern and computes the necessary input for NOISEMAP3.4. This manual uses the helicopter training flight patterns as examples.

Objective

This manual was designed to guide the reader in using the DRIVER program.

Use of the Program

DRIVER has a few rules that the user must keep in mind when using it. First, DRIVER can only be used with rectangular flight patterns with no more than three altitude changes, excluding ascent and descent. Second, all information must have English units (DRIVER assumes English units). Third, there is a predetermined method of numbering reciprocal runways which must be followed.

This manual deals with three broad areas of study: (1) acoustics, (2) computer programming and (3) aviation. Because few readers are familiar with all three areas and the terms involved, a glossary has been included explaining the technical terms used in each area. The reader should read the glossary to become familiar with the terms before proceeding with the user instructions.

The complete input file includes input for both NOISEMAP3.4 and DRIVER. This report will establish the order of instructions to follow in the input file, give a brief description of what each involves, whether it is necessary, and which program responds to the instruction.

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[1] NOISEMAP3.4 Computer Program, Operator's Manual, AMRL-TR-78-109, Aerospace Medical Research Laboratory, Wright-Patterson AFB, OH (December 1978).

2 INPUT FILE INSTRUCTIONS

The first instructions in the file are the NOISEMAP3.4 initialization instructions. These cards are not recognized by DRIVER and therefore will not be affected as they pass through to the DRIVER output. These instructions give the basic dimensions of the grid and should be known constants before the program is started.

The second instructions are the SEL and AL profile instructions. These too are NOISEMAP3.4 instructions and are not affected by DRIVER. These cards tell how the noise propagates from a particular aircraft.

The next four types of instructions are DRIVER instructions.

1. Mandatory $RUNWY instruction tells where the runway is. A $RUNWY instruction must be entered for each runway. The rules for whether the reciprocal of the runway must be entered are covered in the keyword section.

2. Mandatory $FLITE or $TABLE instructions involve multiple cards describing the flight pattern, such as length of flight, turns, altitude and speed of ascent and descent. Essentially these instructions are the same. The differences between and the advantages of these two instructions are covered in the keyword section.

3. Impulsive correction instructions ($IMPER and $NOIMP) are optional and used as necessary to more accurately describe the data. The two impulsive correction instructions are $IMPCR, used when impulsive correction is needed, and $NOIMP, used when impulsive correction is not needed.

4. Mandatory $ACTON instructions tie all of the information together. $ACTON instructions tell which aircraft, pattern, runway, and how many iterations are being considered. A program will use many $ACTON instructions depending on how many variables are involved.

The final instructions in this input file are NOISEMAP3.4 instructions and, as before, are not affected by DRIVER. These cards specify the output desired from NOISEMAP3.4. Usually, one or more of DMPGRD, PLOT, PRPLOT are used. END must be the last card in the input file.

These are the instructions that must be included in the complete file. Other optional instructions are available and are discussed in the keyword section along with a more detailed description of each of the instructions.

3 PROGRAM INFORMATION

DRIVER produces two types of output--the input for NOISEMAP3.4, and an informative output with which the user verifies that the correct DRIVER output is being input into NOISEMAP3.4.

First, DRIVER is run to produce the detailed information necessary to run NOISEMAP3.4. This includes the airfield description information which DRIVER repeats unchanged, and also the flight pattern description. Remember that this information was entered with $FLITE or $TABLE instructions. These instructions are expanded by DRIVER, producing the more detailed information and proper format needed to run NOISEMAP3.4. DRIVER also expands the information by calculating unknown variables from those already known. For example, NOISEMAP3.4 needs the angle of ascent which is not known. DRIVER will calculate this from the known rate of ascent and speed.

The purpose of the second DRIVER output is to allow the user to verify that the first output from DRIVER is correct input for NOISEMAP3.4. DRIVER output copies all information received and all NOISEMAP3.4 cards to allow the user to check for incorrect input. DRIVER also checks that all input is possible and within the limitations of the program; for example, that the flight pattern is rectangular, that the angles of ascent and descent are within 0 to 90 degrees, that correct characters are used (alpha or numeric), and that the runway displacement is within the runway requirements. The second output also includes the results of internal computations, another way for the user to check for DRIVER input errors.

DRIVER and NOISEMAP3.4 are each executed with their respective control files. The control file performs three main steps.

1. It retrieves the data and program from a memory.

2. It runs the program on the program input data.

3. It saves output from the program.

First DRIVER is executed with its control file. The user then checks its output for errors and makes modifications. The most common modification is the need for UNITS instructions because of inconsistent units. (See Example 2 in Chapter 6.) Then, when all errors in DRIVER are corrected, NOISEMAP3.4 is executed wih its control file.

The standard control file is given and explained in Chapter 6. The minor modifications necessary for each individual use of the program are also given (e.g., data file name and output file name).

4 KEYWORDS

General

This section explains each DRIVER program instruction. Following is a list of DRIVER keywords, with a short general description of each. They are in alphabetical order for easy reference.

$ACTON--specifies which aircraft is flying which pattern on which runway and how many times it does it during the day and night. (Needed)

$DEBUG--produces extra information in the DRIVER (informational) output to try to figure out a problem. (Optional)

$FLITE--describes a flight pattern. (Needed*)

$IMPCR--tells where to use an impulse correction factor. (Optional)

$INACT--allows the user to enter information interactively. (Optional)

$LCEIL--changes the landing ceiling. (Probably used only for research purposes.) (Optional)

$NEW--starts over with a new set of flight descriptions. All previous information is lost. (Optional)

$NOIMP--tells where not to use an inpulse correction factor. (Very similar to $IMPCR.) (Optional)

$RUNWY--gives number and location of runway. (Needed)

$TABLE--describes a flight pattern. (Needed*)

*FLITE or TABLE can be interchanged.

Keyword Explanations*

```
A C T O N  Keyword                                              (Necessary)
$ACTON       24       11        2       7.4    0.467               OH58LHP
1     67      45       23       01        89       67               01  45 7
              11       22       33        33       44               77  77 7
```

COLUMNS	
1 - 6	$ACTON keyword
7 - 14	heading of runway
15 - 22	runway number used in runway library (1-18)
23 - 30	flight description number
31 - 38	average number daily daytime pattern iterations
39 - 46	average number daily nighttime pattern iterations
47 - 62	blank
63 - 70	library identifier (TABLE, FLITE, or Blank)
71 - 74	helicopter identification (OH58, AH1G, UH1H, UH60, CH47, TH55, S76)
75 - 77	code for direction of pattern "LHP" (Left-Hand Pattern), left turns; "RHP" (Right-Hand Pattern), right turns

The $ACTON card specifies a complete pattern description and produces the necessary NOISEMAP3.4 cards.

The heading of the runway is between 1 and 36. Magnetic north is 36. Other headings are computed by first finding the clockwise angle (in degrees) between magnetic north and the runway. This angle is divided by 10 and rounded to the nearest integer to give the heading.

Both the flight description number and the library identifier are necessary to specify a flight description. The library identifier tells which library, and the flight description number tells which entry.

Flight descriptions are stored in two different libraries. The library identifier tells in which library to look for the flight description. If a flight description was entered with a $TABLE instruction, then it is in the table library, if it was entered with a $FLITE instruction, then it is in the flight library. The library identifier can be "TABLE" or "FLIGT" or blank. If the field is blank, DRIVER assumes the flight description is in the table library.

The flight description number gives the index to the flight description. Both the table library and the flight library are numbered from 1 to 20. The flight description number tells which entry (by number) in the library has the correct flight description.

---

*Keyword explanations are in the following format:

1. Name of keyword.
2. An example of the instruction.
3. A list of the fields, with a short description of each.
4. A detailed explanation of each instruction which includes a general description of what the card does, more detailed descriptions of what goes in the fields, and any cautions or special things to be aware of.

D E B U G Keyword (Optional)
$DEBUG

Columns
1 - 6 $DEBUG Keyword

When DEBUG is in effect, it gives extra information about the internal status of the program at various points. This is useful when DRIVER is issuing errors and the problem is difficult to define, or when DRIVER is not giving the expected output. It should be used rarely--only when the the user needs the extra information. The extra information includes writing out entries into libraries (where the information is stored) as they are made, and writing out intermediate computations. When similar computations are performed at points all along the flight path, the whole series of computations is written out. $DEBUG significantly increases the amount of put--almost tripling it.

If the user has some idea where a problem is, /she can reduce the amount of extra output by inserting the $DEBUG card righ' efore the suspected problem. There will not be as much extra output, it will include all the useful information.

The $DEBUG card cannot be "turned off," except by starting all over with a $NEW card. After a $NEW card, DRIVER remembers nothing it was told before, so the user has to reissue all instructions.

F L I T E Keyword (or **$TABLE**) **(Needed)**

```
$FLITE5.     6000.    9000.   12000.   9000.   6000.  750.
    1800.    RADS     3.      ANGL     1000.   50.    RATE
   67        5        3       1        9       7      5       3
                      2       3        3       4      5       6       7
```

Columns	CARD 1
1 - 6	$FLITE keyword
7 - 14	flight description number
15 - 22	length of the upwind segment (ft)
23 - 30	length of the crosswind segment (ft)
31 - 38	length of the downwind segment (ft)
39 - 46	length of the base segment (ft)
47 - 54	length of the final segment (ft)
55 - 62	pattern height (ft)
63 - 70	blank
71 - 78	RDSINCLUD if lengths of the pattern segments include the radii of the turn at each end

	CARD 2
1 - 6	blank
7 - 14	turn radius (ft) or rate of turn (deg/sec) or bank angle (deg)
15 - 22	blank if previous field is turn radius, otherwise speed at pattern height (knots)
23 - 30	RADS or RATE or BANK--RADS if turn radius given in cols 7-14; RATE if rate of turn given; BANK if bank angle given
31 - 38	angle of ascent (deg) or rate of ascent (ft/min)
39 - 46	average horizontal speed during ascent (knots), if previous field is rate. Otherwise blank
47 - 54	ANGL or RATE--ANGL if angle of ascent given in cols 31-38; RATE if rate of ascent given
55 - 62	angle of descent (deg) or rate of descent (ft/min)
63 - 70	average horizontal speed during descent (knots), if previous field is rate. Otherwise blank
71 - 78	ANGL or RATE--ANGL if angle of ascent given in cols 55-62; RATE if rate of ascent given

The $FLITE instruction gives a complete description of one of the flight patterns used. This is most of the information that must be repeated for NOISEMAP3.4. The $TABLE instruction can also be used to give desciptions of the flight patterns used.

The flight description number gives the index number into the flight library. The $ACTON instruction specifies this flight description by the flight description number.

The pattern height is the height above field level for the helicopter during the level part of its flight.

The lengths of the pattern segments can be measured as in Figure 1 or as in Figure 2. For example, the crosswind segment is measured from B to C in both figures. However, it is longer in Figure 2 because it includes the turns

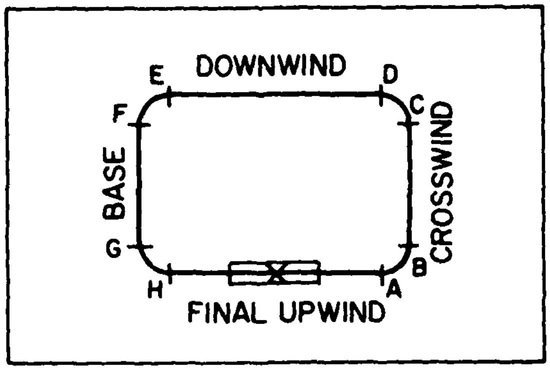

Figure 1. Lengths of segments--does not include turns.

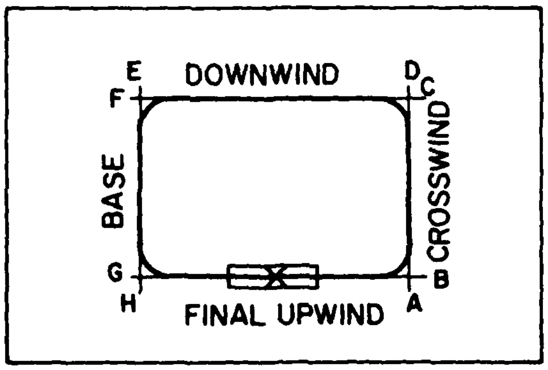

Figure 2. Lengths of segments--includes turns.

at each end, while in Figure 1 the turns are not included. In either case, it must be consistent within a flight description. If the lengths are measured as in Figure 2, then the last field on the first card should contain the word RSINCLUD. DRIVER will convert the pattern to match Figure 1 for the output.

Because on the second card there are choices for what to put in fields 2, 3, 5, 6, 8, and 9, fields 4, 7, and 10 are used to tell DRIVER what choice was made. Fields 4, 7, and 10 (that is, cols 23-30, cols 47-54, and cols 71-78) tell which quantities are in the two fields before them.

The choices for specifying the turn in fields 2, 3, and 4 are:

2	3	4
turn radius	blank	RADS
rate of turn	pattern speed	RATE
bank angle	pattern speed	BANK

Fields 5, 6, and 7 give information to determine the angle of ascent. It can be given explicitly, or computed (by the DRIVER program) from the rate of ascent. From the angle of ascent, the ground distance covered during ascent is determined. The choices for specifying this information, in fields 5, 6, and 7 are:

5	6	7
angle of ascent	blank	ANGL
rate of ascent	average horizontal speed during ascent	RATE

For the second choice (i.e., rate of ascent), the horizontal component of the aircraft's speed (ground speed) can usually be approximated by the helicopter's air speed. At angles less than 20 degrees, this approximation is almost exact (because sin 20 degrees is still very close to 1). It should not differ significantly until the angle of ascent reaches about 35 degrees. This difference is less accurate in strong winds, because neither DRIVER nor NOISEMAP3.4 have provisions for correcting for the wind. (The problem is that the aircraft flies slower into a strong wind and faster with a strong wind, but its airspeed is the same.)

Fields 8, 9, and 10 give information to determine the angle of descent. DRIVER determines the ground distance covered during the descent from the descent angle. The choices for specifying this information in fields 8, 9, and 10 are:

8	9	10
angle of descent	blank	ANGL
rate of descent	average horizontal speed during descent	RATE

For the second choice (i.e., rate of ascent), the horizontal component of the speed (ground speed) can be approximated by the helicopter's air speed under the same conditions as during ascent.

I M P U L S E   C O R R E C T I O N Keyword   (Optional)

```
$IMPCR       1        2
1    6       4        2
             1        2
```

Columns

1 - 6	$IMPCR keyword
7 - 14	phase number
15 - 22	phase number
23 - 30	phase number

phase #1 is climbing
phase #2 is level flight
phase #3 is descending

There is a correction factor for the extra annoyance caused by a helicopter's impulsive noise. The $IMPCR instruction causes a correction factor to be added to only the phases specified. If no phases are specified, the impulse correction factor is used for all phases (program default).

Since there is a default value for using correction (using it everywhere), this card should be used when only some parts of the flight need the impulse correction. For example, if a helicopter ascends very quickly, there will be little impulsive character in the noise produced during the ascent. Thus impulse correction should be used for only phase 2 and phase 3. (Also see $NOIMP keyword.)

I N T E R A C T I V E Keyword (Optional)
$INACT

Columns
1 - 6 $INACT Keyword

The $INACT keyword allows the user to enter data interactively (at a terminal). The user enters data from a set of cards to a complete DRIVER input file. (The card sets can be different sizes.) Then DRIVER reads and acts upon the set of cards which the user just entered. After DRIVER finishes a set, the user can enter more data.

The last card should be $EXIT (which terminates the program).

While the user is entering data interactively, he/she separates the fields by commas. The program will place the information correctly. The user has the following options when entering data interactively:

!C change --allows the user to change the current card
--must start the card over after prompt
--must be the first symbol on the line (no blanks before it)

!S# same --allows user to copy fields from previous card
--can be anywhere in the card
--"#" is the number of fields to be copied
--"#" read in an I2 format.

"!S#" copies the next # fields from the corresponding fields of previous card. I2 format means that for a 1-digit number, the space after the "S" must be a "0" or a blank space. If # is not specified (i.e., is blank), the next field of the previous card is copied onto the current card. Any fields not specifically given after an "!S" command will be duplicated from the previous card.

For example, "1, 2, !S03, NEXT" would put "1" in the first field, "2" in the second field, copy the next three fields (i.e., fields 3, 4, and 5) from fields 3, 4, and 5 of the previous card, put "NEXT" in the sixth field, and copy the rest of the card from the corresponding part of the previous card.

!X cross out --allows user to blank out the rest of card

If the user uses a "!S 3" to copy three left-hand fields from the card before, but doesn't want any other fields copied, he/she can use the "!X" command at the end of the line.

In the above example, if "!X" was after the "NEXT", the card would be blank after the word "NEXT".

!Q quit --allows the user to stop entering data and lets DRIVER process data entered

For example, to create a card with the numbers 1 to 10 in the first 10 fields, one number in a field, the user would type "1,2,3,4,5,6,7,8,9, 10[cr]". To make the next card the same, except with "five" in the fifth field, the user would type "!S 4, five [cr]". (Note: [cr] means carriage return.)

As another example, to create a card with "111" in the first field, the second and third fields duplicated from the previous card, "4" and "5" in the fourth and fifth fields, respectively, and the rest of the fields copied from the previous card, the user would type "111, !S 2, 4, 5 [cr]". If the last fields should be blank instead of copied, the user would type "111, !S02, 4, 5, !X [cr]".

L A N D I N G   C E I L I N G Keyword (Optional)

$LCEIL300.

Columns	
1 - 6	$LCEIL Keyword
7 - 14	landing ceiling, in feet above ground level (AGL)

The $LCEIL instruction tells DRIVER when to start recognizing the extra noise generated during a landing. The landing ceiling is the altitude during the descent at which the SEL (Sound Exposure Level) profile switches from the fly-over SEL profile to the landing SEL profile.

The program default is 200 ft to agree with the current theory. This should not be changed except by someone who understands the full implications of this change on the propagation of noise.

N E W Keyword (Optional)

$NEW

Columns

1 - 4 $NEW Keyword

The $NEW instruction clears the already-entered information from DRIVER's memory. This is usually used to "clean the slate" before starting a new airfield.

N O I M P U L S E C O R R E C T I O N Keyword (Optional)

```
$NOIMP   3         1
```

Columns	
1 - 6	$NOIMP Keyword
7 - 14	phase number
15 - 22	phase number
23 - 30	phase number

phase #1 is climbing
phase #2 is level flight
phase #3 is descending

There is a correction factor because helicopters produce impulsive nose. The $NOIMP instruction causes the correction factor not to be used for only the phases specified. If no phases are specified, it has the same effect as specifying all the phases (i.e., the impulse correction factor is not used for any phases).

Since there is a default value for using impulse correction (using it everywhere), this instruction should be used when some parts of the flight do not need the impulse correction. For example, a fixed-wing aircraft (airplane) produces no noise with an impulsive character. Thus, impulse correction should not be used for any phase. (Note: DRIVER does not recognize any airplane as the aircraft to use. [Also see $IMPCR keyword.])

R U N W A Y		Keyword				(Needed)			
$RUNWAY		4	2	34718	109	34871	238	75	100
1	6	4	2	0	8	6	4	2	0
		1	2	3	3	4	5	6	7

Columns

1 - 6	$RUNWY Keyword
7 - 14	heading of runway (1 - 36)
15 - 22	runway number (1 - 18) to differentiate runways with the same heading (parallel runways)
23 - 30	x coordinate at start of runway
31 - 38	y coordinate at start of runway
39 - 46	x coordinate at end of runway
47 - 54	y coordinate at end of runway
55 - 62	takeoff threshold displacement --if blank defaults to half of runway length
63 - 70	landing threshold displacement --if blank defaults to half of runway length

The heading of the runway is between 1 and 36. Magnetic north is 36. Other headings are computed by first finding the clockwise angle (in degrees) between magnetic north and the runway. This angle is divided by 10 and rounded to the nearest integer to give the heading.

The assignment of runway numbers is arbitrary, except that the numbers for the same runway in opposite directions (reciprocal runways) should differ by 9.

The takeoff and landing threshold displacement tells where takeoffs and landings begin, if it is not the beginning of the runway. The beginning of the takeoff is when the aircraft starts its takeoff roll. The beginning of the landing is when the aircraft is 50 ft above the ground on its descent.

DRIVER assumes the aircraft are helicopters and that they can take off and land at steeper angles than airplanes. This allows putting both displacements in the center of the runway to specify that the helicopter lands in the center of the runway and then takes off from the same spot. (This is what happens for most training flights.) The default values for the displacements are the center of the runway.

The takeoff and landing threshold displacements may be left blank. In this case, the threshold displacement is the default value (half of the runway length).

Neither DRIVER nor NOISEMAP3.4 checks to make sure that the runway coordinates specify a runway that heads in the direction specified by the runway heading. However, NOISEMAP3.4 does compute the runway heading from the runway coordinates and writes it for the user to check.

Each $RUNWY instruction will put up to two new entries into the runway library. The first runway entered is the runway specified by the card. If the reciprocal of this runway (the same physical runway, but the helicopter heads

in the opposite direction) has not been entered, then the reciprocal is also entered. The runway number of the reciprocal runway differs from the runway number of the original by 9 (staying between 1 and 18). The coordinates of the start and end of the reciprocal are simply the reverse of the original. The takeoff and landing thresholds of the reciprocal are the default values of *half the runway* length. If the user wants to use values for the takeoff or landing displacements other than the default values, the reciprocal runway must be entered separately. This will overwrite the previous entry in the runway library. When an entry is overwritten, the heading for the contents of the entry is:

NOW HOLDS

If $DEBUG is in effect, the previous contents of the entry will be listed under the heading:

Runway Number XX, Runway Heading XX already in library--entry overwritten.
Used to hold:

Then the new contents of the entry under the heading:

NOW HOLDS

T A B L E Keyword (or $FLITE) (Needed) $TABLE1
RADSINCLUD

4600.	0.	70.	15.	400.	UPW
4600.	70.	90.	400.	600.	CRSW
9200.	90.	90.	600.	600.	DWNW
4600.	90.	80.	600.	400.	BASE
4600.	80.	0.	400.	10.	FINL
7	5	3	1	9	1
	1	2	3	3	7
500.	90.	9.	80.	1825.	RDUS

CARD 1

Columns	
1 - 6	$TABLE Keyword
7 - 14	number of table
15 - 70	blank
71 - 80	RADSINCLUD if the lengths of the segments include the turns. If not, this field should be left blank.

CARD 2

1 - 6	blank
7 - 14	length of upwind (takeoff) segment in feet
15 - 22	speed, in knots, at start of upwind segment
23 - 30	speed, in knots, at end of upwind segment
31 - 38	height AGL (above ground level) in feet at start of upwind segment
39 - 46	height AGL, in feet, at end of upwind segment
47 - 70	blank
71 - 74	UPW (pattern segment alpha identification)

CARD 3

1 - 70	same as card 2, but describing crosswind segment
71 - 74	CRSW

CARD 4

1 - 70	same as card 2, but describing downwind segment
71 - 74	DWNW

CARD 5

1 - 70	same as card 2, but describing base segment
71 - 74	BASE

CARD 6

1 - 70	same as card 2, but describing final segment
71 - 74	FINL

CARD 7

1 - 6	blank
7 - 14	takeoff climb rate in feet/minute
15 - 22	speed upon reaching pattern altitude in knots
23 - 30	landing descent glide slope in degrees
31 - 38	speed at start of descent in knots
39 - 46	turn radius in feet, or turn rate in degrees/second, or bank angle in degrees
47 - 70	blank
71 - 74	RDUS, RATE, or BANK --RDUS if radius given in cols 39-46; RATE if rate of ascent given; BANK if bank angle given.

The $TABLE instruction gives a complete description of one flight pattern used. This is most of the information that is repeated in NOISEMAP3.4. The $FLITE instruction holds the same kind of information. Probably many sets of $TABLE and $FLITE instructions will be needed. Anytime any piece of information is changed, a new entry must be entered. For example, if the upwind segment (see Figure 3) is 800 ft long and the final segment (see Figure 3) is 1000 ft when taking off from one end of the runway, and vice-versa when taking off from the other end, then two $TABLE instructions are needed.

DRIVER checks to make sure the flight path is rectangular; that is, DRIVER checks to make sure that the crosswind and base segments are the same length, and that the length of the takeoff segment plus the length of the final segment is equal to or less than the length of the downwind segment (takeoff + final =< downwind).

NOISEMAP3.4 checks the descent glide slope (angle of descent) in the RUNWAY instruction to make sure that it is between 0.5 and 10.0 degrees. DRIVER always creates an altitude profile (ALTUDE instruction), which overrides the descent glide slope specification on the RUNWAY instruction. However, NOISEMAP3.4 does not process a RUNWAY instruction with a glide slope not in this range. If a runway has flights on it which use a glide slope between 0.5 and 10.0 degrees, these flights should be entered before the flights using a glide slope not in this range. If this is not possible, the DRIVER (NOISEMAP3.4) output should be searched for the RUNWAY instruction with the glide slope out of range. (Check the NOISEMAP3.4[2] user's manual for the exact format of the instruction.) NOISEMAP3.4 will run correctly when the glide slope field is blank. So blanking out the glide slope allows a "good" NOISEMAP3.4 run.

[2] AMRL-TR-78-109.

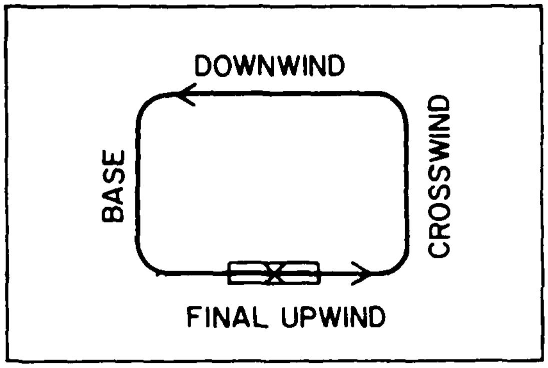

Figure 3. Names of segments of flight path.

5 HOW TO RUN DRIVER AND NOISEMAP3.4

The DRIVER and NOISEMAP3.4 programs are available only on the Boeing Computer Services (BCS) network. It is assumed that the user has access to BCS, and knows how to sign on and off.

This section covers the procedure for running NOISEMAP3.4 and DRIVER and gives sample Job Control Language (JCL) files for running them.

The working DRIVER and NOISEMAP3.4 programs are in files named DRIVERB and NSMAPB in user number (UN=)CER022. The data files, which hold the information that specifies the aircraft operations, change most often. Usually the user creates different aircraft operations. The NOISEMAP3.4 results of DRIVER running on a data file must be saved. The result of DRIVER is file of correct input for NOISEMAP3.4. The results of NOISEMAP3.4 running on this file are in a file of correct input for a plotter or the final results the user wants. (NOISEMAP3.4 can produce a variety of results.) If there is a plot file, it is run through a plotter to produce a plot as the final result. The final result depends on the original information in the data file.

The JCL file controls running the programs. DRIVER and NOISEMAP3.4 are usually run separately for two reasons. One is that there may be errors when trying to run DRIVER which would make it useless to try to run NOISEMAP3.4. The other reason is that the users often have to modify DRIVER's NOISEMAP3.4 output before it says exactly what they want.

If there are errors, the user will want to modify the input file so the program works correctly. (There are other reasons for wanting to modify a file, e.g., Example 2 in Chapter 6.) The easiest way to modify a file is to use CME which is the editor for BCS.

For example, say the DRIVER data file, DVRIN1, is producing incorrect results because DRIVER keyword $RUNWY has been misspelled $RUNWAY. First the user looks at the informative output from DRIVER and notices that something is wrong. The user then looks more closely and discovers that DRIVER keyword is misspelled. The user then signs on to BCS to make corrections on file DVRIN1. This is the command sequence to be able to edit DVRIN1.

```
C>          or N>
  GET,DVRIN1
C>          or N>
  CME,DVRIN1
E>
```

The user may get either "C>" or "N>" as a prompt when he/she signs on. In either case, the user response to the first prompt should be a "GET" command. Similarly, the user's response to the second prompt should be a "CME" command, with the command followed by a comma and the file which needs to be corrected. The user will get a prompt of "E>" after the "CME" command. This means the user is now in the editor mode of the program. The user should give only editor commands at this point.

To make the corrections in DVRIN1, the user has to (1) find the misspelling, (2) correct the misspelling, and (3) save the correction. The user now has a couple of ways to find the place needing corrections. The easiest way to find the correction is with the "LOCATE" command. To do this, the user will type "LOCATE/string/", with string being the incorrect spelling of the word. LOCATE will then print the line the word is in. At this point, the user will use the "CHANGE" command by typing "CHANGE/string1/string2/", or wrong spelling to correct spelling. The user can then move onto the next error of the same word by using the "LOCATE" command again by simply typing "LOCATE", and correct the incorrect spelling by typing "CHANGE". The computer will remember the LOCATE and CHANGE command if all the corrections are to be the same. One thing to remember, however, is that with CME it will read only from the "TOP" of the file to the "BOTTOM". The user can move to the first line by typing "TOP" and proceed through the file with "NEXT" to print the next line. To move down several lines the user must type "NEXT #", wher # is the number of lines you want to move down. You may also go up in a file by using "UP #" the same way. CME will print the line it moves to each time so the user can see where he/she is in the file. The computer will type the correct change after the user has input the correction. To see several lines at the same time, the user must type "PRINT #", where # is the number of lines he/she wants to see. Each of these commands is followed by a carriage return so the computer knows to do something.

After all the changes have been made and the user is satisfied with the corrected file, he/she issues the instruction "FILE,0". This instructs the computer to save all the changes made and takes the user out of the CME program. The computer will respond with the original prompt of either C> or N>.

Now the editing is done and the user can try to run the program again. The user needs a JCL file to run a program. Two JCL file examples are attached to this section. One is for the DRIVER program and the other runs the NOISEMAP3.4 program. Any name in lower case letters with hyphens in it is a description of the file whose name should be there. For instance, in the first JCL file is the instruction "GET,DATA= name-of-input-file." When the user makes this file, he/she should replace "name-of-input-file" with the name of the input file such as DVRIN1.

```
DRVRJCL,Ttime,CMspace,Ppriority.
USER,USERNO,PASSWORD.  user identification
GET,LGO=DRIVERB,DATA=name-of-Driver-input-file.
COPYSBF,DATA,OUTPUT,5. put data file at beginning of output
REWIND,DATA.
RENAME,TAPE3=DATA.  Driver looks for input in tape3
LGO.   run the driver program
REPLACE,TAPE7=name-of-Driver-output/Noisemap-input-file.
COMMENT.  Driver puts the Noisemap input in tape7
EXIT,U.  comes here even if error, so can save output
REPLACE,OUTPUT=name-of-full-Driver-output-file.
COMMENT.  includes descriptive output, error msgs, & input file
GET,name-of-full-Driver-output-file.
COPYBF,name-of-full-Driver-output-file,output,5.  get printout
```

```
NSMPJCL,Ttime,CMspace,Ppriority.
USER,USERNO,PASSWORD.   user identification
GET,LGO=NSMAPB,INPT=name-of-Noismap-input-file(Driver-output).
COPYSBF,INPT,OUTPUT.  put copy of input at front of output
REWIND,INPT.
LGO,INPT.   run Noisemap
FILES.  useful, if get error that a file is not found
REPLACE,TAPE14=name-of-file-to-save-in.  if "DMPGRD" to unit 14
REPLACE,TAPE15=name-of-file-to-save-in.  if "DMPGRD" to unit 15
REPLACE,TAPE8=name-of-file-to-save-in.  if "PLOT"
REPLACE,TAPE11=name-of-file-to-save-in.  if "PLOT"
EXIT,U.  comes here, even if error, so can save output
FILES.  useful if get error that a file is not found
REPLACE,OUTPUT=name-of-noisemap-output-file.  save it
GET,OUTP=name-of-noisemap-output-file.
COPYBF,OUTP,OUTPUT,100.   get a printout of output
```

In each JCL file, the numbers following "T", "CM", and "P", can be changed. The number after the "T" tells how much time in seconds the job can run. The number after the "CM" tells how much core memory the job needs (250000 is about the right size and should be used by any user who doesn't know how much core memory the job needs--or even what core memory is). The number after the "P" tells the priority of the job. The higher the priority, the faster the job finishes and the more it costs. Usually priority 2 (P02) finishes fast enough and costs significantly less than priority 4, the next higher priority.

After making the input file, the user should do the following to get the desired results:

1. Submit the DRIVER JCL file.

a. sign on to the computer.

b. give the following commands.

```
C>  GET, name-of-the driver-jcl-file
C>  SUBMIT, name-of-the-driver-jcl-file,EI=RTE-number,
    name-of-driver-jcl-file
SUBMITTED AT time IS NOT JOB jobname
C>
```

2. Look at the informative DRIVER output, check for errors. If there are errors, correct the input file and repeat steps 1 and 2 until there are no errors.

3. Make necessary modifications in DRIVER's NOISEMAP3.4 output. (See Example 2 in Chapter 6 for sample modifications.)

4. Submit the NOISEMAP3.4 JCL file. Use the same commands as for DRIVER JCL file.

5. Look at the informative NOISEMAP3.4 output. Check for errors. If there are errors, correct the NOISEMAP3.4 input file and repeat steps 4 and 5 until there are no errors.

6. Get the final results. How to get the final results varies according to what form they are in--e.g., plot, grid of posted dB levels.

a. Plot. To get a plot, the user should consult someone who knows how to use the nearest plotter. It depends on the plotter and there is no fixed, general method of plotting.

b. Printer Output (i.e., NOISEMAP3.4 PTRPLOT or DMPGRD keywords). To get output on a printer, the user should copy the appropriate file to output. The appropriate file is usually TAPE15, or rather the file TAPE15 was saved in. (See the NOISEMAP3.4 JCL file.) To get a copy of it, use the route command after signing on to the computer.

6 SAMPLE RUNS

Example 1

This section shows a sample run of the DRIVER program. This example does not include collecting the data, but it does show the user how to proceed after receiving the data (shown in Figure 4). The data shown are fairly simple and straightforward, but still reasonably realistic.

Example 1:

1. Has two different helicopters (UH1 and CH47)
2. Has an odd number (3) of runways
3. Gets a grid of posted values as the NOISEMAP3.4 output
4. Explains and computes the headings of the runway
5. Has two different angles of descent

Example 1 uses the following instructions:

From DRIVER	From NOISEMAP3.4
$RUNWY	AIRFLD
$TABLE	PROCES
$ACTON	SEL
	AL
	DMPGRD
	END

The first step is to form a general idea of what output from NOISEMAP3.4 is needed. Generally used output includes (1) a plot (PLOT), (2) a posting of noise levels at regularly spaced points (DMPGRD), and (3) a rough plot on a line printer (PRPLOT).

The NOISEMAP3.4 PLOT instruction produces a plot of equal decibel (dB) contours--that is, it connects points at the same noise level. The PLOT instruction actually produces a file of GPCP input (General Purpose Contouring Package--a way of plotting contours) for the plot. The plot has to be drawn separately by whatever plotting facilities are available.

The NOISEMAP3.4 DMPGRD instruction superimposes a grid over the area and prints the noise level at each point of the grid. It is printed on a regular printer, but is still to scale. The NOISEMAP3.4 PRPLOT instruction produces rough contours on a regular printer. Points at the same level have the same letter printed on them. The letters form rough contours, and the contours are to scale. This example asks for a grid output (DMPGRD).

The first cards in a DRIVER input file should be the first cards in the NOISEMAP3.4 input file. These cards should include an AIRFLD instruction and a PROCES instruction. Next come the SEL (sound exposure level) and AL (A-weighted noise level) instructions. The SEL and AL instructions give information about the noise level at various distances from the aircraft during the flight (SEL) and run-up (AL). They differ from aircraft to aircraft, but are constant for each aircraft. Since this information is constant and large, it is usually stored separately. It can be put into the DRIVER input or into the NOISEMAP3.4 input with an editor. It does not matter

Date	Field	DAY		NIGHT
Field Height (MSL)				
Runway 9	% utilization	60%		70%
Runway 27	% utilization	40%		30%
GENERAL INFORMATION	Aircraft Type	UH1	CH47	UH1
	No. of Aircraft/Period	10	3	1
	Number of Periods	2	2	1
	% Utilization	90%		80%
	Annual Corridor Ops.			
	Basefield			
	Corridor Route			

		DAY		NIGHT
STAGEFIELD OPERATIONS	Annual Field Ops.	354	106	.12
	Annual Field Pattern Iterations	177	53	.06
	Iterations per Runway	59	17.7	.02

Pattern Segments:

(speed in knots)
(height/length in feet)

Leg	Length	Starting Speed	End Speed	Start Height (AFL)	End Height (AFL)
Takeoff	4600	0	80	0	400
Crosswind	5000	80	90	425	700
Downwind	9200	90	90	700	700
Base	5000	90	80	700	400
Final	4600	80	0	375	0

Takeoff climb rate (ft/min) 500

Speed upon reaching pattern height 90

Radius of turn or bank angle 1800

Landing descent glide slope 5° - 50%, 7° - 50%

Speed at start of descent 80

NOTES: Leg lengths do not include the turn radius.

Figure 4. Data sheet for Example 1.

whether the SEL and AL are put into DRIVER or NOISEMAP3.4 input because the SEL and AL instructions are NOISEMAP3.4 instructions, so DRIVER will not do anything to them (if they are in the DRIVER input).

The standard spacing of the grid is 1000 ft. The grid is 100 x 100 points. With the runways in the middle, the lower left-hand corner is close enough to (0.0, 0.0). From the map (Figure 5), the field altitude is 8 ft above sea level, and the magnetic declination is 0 degrees (to the east). Thus the NOISEMAP3.4 AIRFLD instruction is as follows:

```
AIRFLD0.0     0.0      0.0      8.       1000.                              EAST
      EXAMPLE 1
```

The NOISEMAP3.4 PROCES instruction is next. It is very simple, just "PROCES".

The UH1 and CH47 helicopters are being used. The SEL and AL instructions for them should be next. The U.S. Army Construction Engineering Research Laboratory (CERL) determined the information for these cards empirically and stored the information for reference. The user can find the CERL determined SEL and AL cards for some helicopters in the Appendix. For other aircraft, contact the manufacturer for this information. The necessary SEL and AL instructions for this example are as follows:

```
COMMENT 6241 - TAKEOFF,FLYOVER - UH-1H
SEL   6241.   1.      93.7    92.5    91.0    89.6    88.1    86.7    UH1H TO  1
      84.9    83.5    82.0    80.2    79.3    76.1    73.7    70.5    UH1H TO  2
      67.6    64.5    61.0    58.0    54.8    51.1    47.3    43.2    UH1H TO  3
      6241.   2.      98.7    97.5    96.0    94.6    93.2    91.9    UH1H TO  4
      90.3    89.0    87.7    86.4    85.0    83.6    82.3    80.6    UH1H TO  5
      79.0    77.1    75.1    73.3    71.1    68.5    66.1    63.4    UH1H TO
COMMENT 6242 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6242 - HELICOPTER UH-1H
SEL   6242.   1.      98.7    97.5    96.0    94.6    93.1    91.7    UH1H FO  1
      89.9    88.4    86.6    84.3    81.7    78.8    75.4    70.8    UH1H FO  2
      67.6    64.5    61.0    58.0    54.8    51.1    47.3    43.2    UH1H FO  3
      6242.   2.      103.7   102.5   101.0   99.6    98.2    96.9    UH1H FO  4
      95.3    93.9    92.3    90.5    88.4    86.3    84.0    80.9    UH1H FO  5
      79.0    77.1    75.1    73.3    71.1    68.5    66.1    63.4    UH1H FO
COMMENT 6245 - APPROACH - UH-1H
SEL   6245.   1.      99.9    98.7     97.1   95.6    94.0    92.4    UH1HLAND 1
      90.6    88.9    87.3    85.4    83.4    81.1    78.5    75.2    UH1HLAND 2
      72.1    68.8    65.2    62.1    58.8    55.0    51.2    46.9    UH1HLAND 3
      6245.   2.      104.9   103.7   102.1   100.6   99.1    97.6    UH1HLAND 4
      96.0    94.4    93.0    91.6    90.1    88.6    87.1    85.3    UH1HLAND 5
      83.5    81.4    79.3    77.4    75.1    72.4    70.0    67.1    UH1HLAND
COMMENT 6246 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6246 - HELICOPTER - UH-1H
SEL   6246.   1.      104.9   103.7   102.1   100.6   99.0    97.4    UH1HLAND 1
      95.6    93.8    91.9    89.5    86.8    83.8    80.2    75.5    UH1HLAND 2
      72.1    68.8    65.2    62.1    58.8    55.0    51.2    46.9    UH1HLAND 3
```

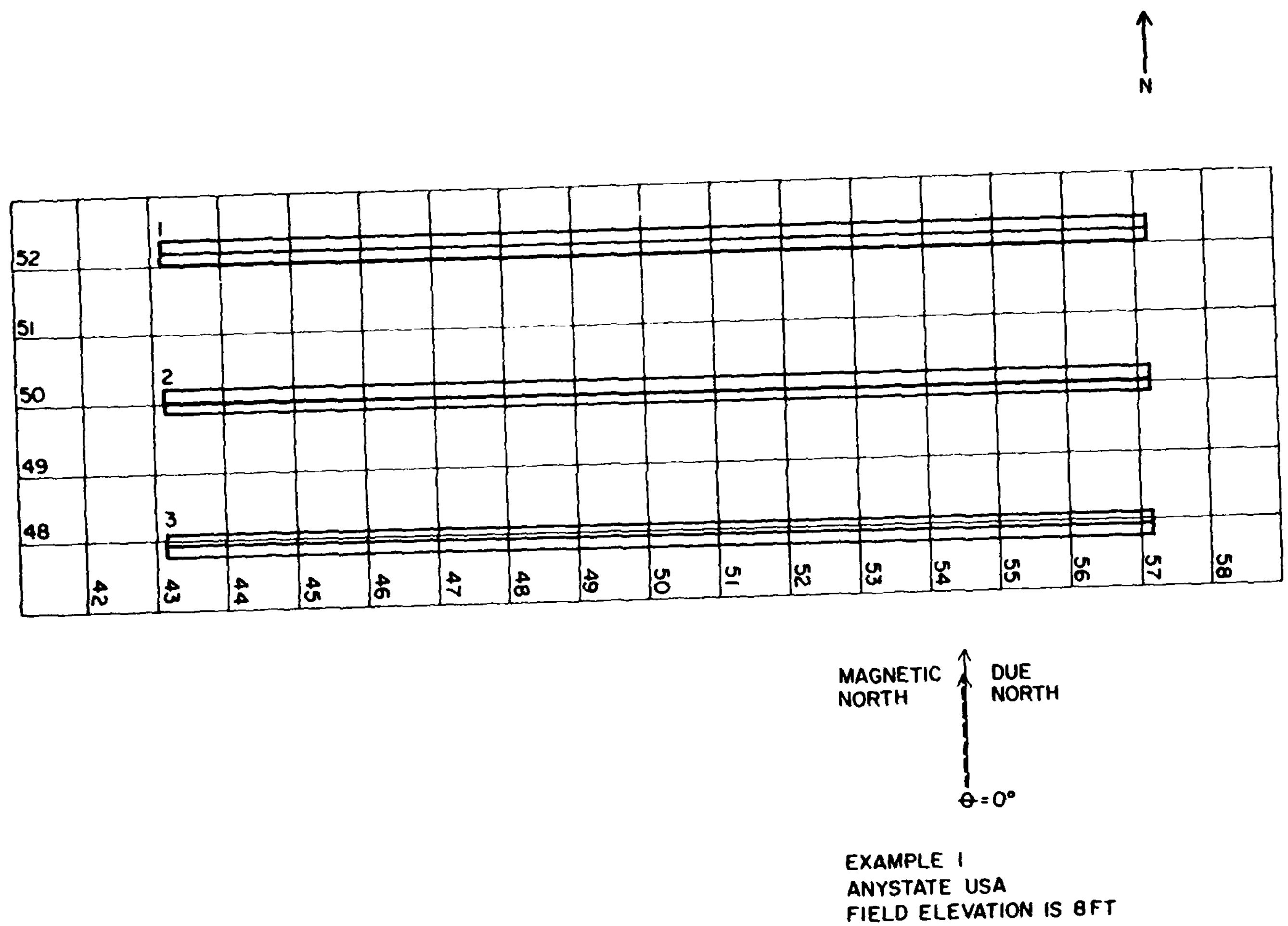

Figure 5. Map for Example 1.

```
        6246.   2.        109.9   108.7   107.1   105.6   104.1   102.6   UH1HLAND 4
        101.0   99.3      97.6    95.7    93.5    91.3    88.8    85.6    UH1HLAND 5
        83.5    81.4      79.3    77.4    75.1    72.4    70.0    67.1    UH1HLAND

COMMENT 624009 HOVER-IN-GROUND EFFECT
COMMENT 624009 HELICOPTER - UH-1H
AL        624009        091.0   88.9    86.9    84.8    82.6    80.4    UH1H   IN 1
        78.2    75.8      73.4    70.8    68.1    65.1    61.8    58.1    UH1H   IN 2
        53.9    49.5      45.8    41.8    37.4    32.7    27.5    22.1    UH1H   IN 3
          624009       3089.8   87.7    85.7    83.6    81.4    79.2    UH1H   IN 4
        77.0    74.6      72.2    69.6    66.9    63.9    60.6    56.9    UH1H   IN 5
        52.7    48.3      44.6    40.6    36.2    31.5    26.3    20.9    UH1H   IN 6
          624009       6091.3   89.2    87.2    85.1    82.9    80.7    UH1H   IN 7
        78.5    76.1      73.7    71.1    68.4    65.4    62.1    58.4    UH1H   IN 8
        54.2    49.8      46.1    42.1    37.7    33.0    27.8    22.4    UH1H   IN 9
          624009       9090.7   88.6    86.6    84.5    82.3    80.1    UH1H   IN10
        77.9    75.5      73.1    70.5    67.8    64.9    61.5    57.8    UH1H   IN11
        53.6    49.2      45.5    41.5    37.1    32.4    27.2    21.8    UH1H   IN12
          624009      12093.0   90.9    88.9    86.8    84.6    82.4    UH1H   IN13
        80.2    77.8      75.4    72.8    70.1    67.2    63.8    60.1    UH1H   IN14
        55.9    51.5      47.8    43.8    37.4    34.7    29.5    23.1    UH1H   IN15
          624009      15096.8   94.7    92.7    90.6    88.4    86.2    UH1H   IN16
        84.0    81.6      79.2    76.6    73.9    71.0    67.6    63.9    UH1H   IN17
        59.7    55.3      51.6    47.6    43.2    38.5    33.3    27.9    UH1H   IN18
          624009      18096.5   94.4    92.4    90.3    88.1    85.9    UH1H   IN19
        83.7    81.3      79.0    76.3    73.6    70.7    67.3    63.6    UH1H   IN20
        59.4    55.0      51.3    47.3    42.9    38.2    33.0    27.6    UH1H   IN
COMMENT 624008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 624008 HELICOPTER - UH-1H
AL        624008        091.5   89.4    87.3    85.2    83.0    80.8    UH1H OUT 1
        78.5    76.1      73.6    71.1    68.4    65.5    62.3    58.7    UH1H OUT 2
        54.6    50.3      46.4    42.2    37.6    32.6    27.2    21.5    UH1H OUT 3
          624008       3090.8   88.7    86.6    84.5    82.3    80.1    UH1H OUT 4
        77.8    75.4      72.9    70.4    67.7    64.8    61.6    58.0    UH1H OUT 5
        53.9    49.6      45.7    41.5    36.9    31.9    26.5    20.8    UH1H OUT 6
          624008       6093.1   91.0    88.9    86.8    84.6    82.4    UH1H OUT 7
        80.1    77.7      75.2    72.7    70.0    67.1    63.9    60.3    UH1H OUT 8
        56.2    51.9      48.0    43.8    39.2    34.2    28.8    23.1    UH1H OUT 9
          624008       9093.5   91.4    89.3    87.2    85.0    82.8    UH1H OUT10
        80.5    78.1      75.6    73.1    70.4    67.5    64.3    60.7    UH1H OUT11
        56.6    52.3      48.4    44.2    39.6    34.6    29.2    23.5    UH1H OUT12
          624008      12097.1   95.0    92.9    90.8    88.6    86.4    UH1H OUT13
        84.1    81.7      79.2    76.7    74.0    71.1    67.9    64.3    UH1H OUT14
        60.2    55.9      52.0    47.8    43.2    38.2    32.8    22.1    UH1H OUT15
          624008      150101.2  99.1    97.0    94.9    92.7    90.5    UH1H OUT16
        88.2    85.8      83.3    80.8    78.1    75.2    72.0    68.4    UH1H OUT17
        64.3    60.0      56.1    51.9    47.3    42.3    36.9    31.2    UH1H OUT18
          624008      18099.1   97.0    94.9    92.8    90.6    88.4    UH1H OUT19
        86.1    83.7      81.2    78.7    76.0    73.1    69.9    66.3    UH1H OUT20
        62.2    57.9      54.0    49.8    45.2    40.2    34.8    29.1    UH1H OUT
COMMENT 6071 - TAKEOFF,FLYOVER - CH-47
SEL     6071.   1.        96.1    94.6    93.3    91.9    90.5    88.9    CH47 TO  1
        87.3    85.8      84.2    82.3    80.4    78.2    75.8    73.1    CH47 TO  2
        70.1    67.0      63.5    60.3    56.6    52.5    48.6    44.7    CH47 TO  3
```

```
       6071.    2.       101.1    99.6     98.3     96.9     95.7     94.2     CH47 TO  4
       92.9     91.7     90.5     89.2     87.9     86.6     85.2     83.7     CH47 TO  5
       82.3     80.5     78.8     77.1     75.1     72.7     70.4     67.8     CH47 TO

COMMENT 6072 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6072 - HELICOPTER CH-47
SEL    6072.    1.       101.1    99.6     98.3     96.9     95.5     93.9     CH47 FO  1
       92.3     90.7     88.8     86.4     83.8     80.9     77.5     73.4     CH47 FO  2
       70.1     67.0     63.5     60.3     56.6     52.5     48.6     44.7     CH47 FO  3
       6072.    2.       106.1    104.6    103.3    101.9    100.7    99.2     CH47 FO  4
       97.9     96.6     95.1     93.3     91.3     89.3     86.9     84.0     CH47 FO  5
       2.3     80.5     78.8     77.1     75.1     72.7     70.4     67.8     CH47 FO
COMMENT 6075 - APPROACH - CH-47
SEL    6075.    1.       102.3    100.8    99.4     97.9     96.4     94.6     CH47LAND 1
       92.8     91.2     89.5     87.5     85.5     83.2     80.6     77.8     CH47LAND 2
       74.6     71.3     67.7     64.4     60.6     56.4     52.5     48.4     CH47LAND 3
       86.8     84.8     83.0     81.2     79.1     76.6     74.3     71.5     CH47LAND
COMMENT 6076 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6076 - HELICOPTER - CH-47
SEL    6076.    1.       107.3    105.8    104.4    102.9    101.4    99.6     CH47LAND 1
       97.8     96.1     94.1     91.6     88.9     85.9     82.3     78.1     CH47LAND 2
       74.6     71.3     67.7     64.4     60.6     56.4     52.5     48.4     CH47LAND 3
       6076.    2.       112.3    110.8    109.4    107.9    106.6    104.9    CH47LAND 4
       103.4    102.0    100.4    98.5     96.4     94.3     91.7     88.7     CH47LAND 5
       86.8     84.8     83.0     81.2     79.1     76.6     74.3     71.5     CH47LAND
COMMENT 607009 HOVER-IN-GROUND EFFECT
COMMENT 607009 HELICOPTER - CH-47
AL        607009        0100.9    98.9     96.8     94.7     92.5     90.2     CH47   IN 1
       87.9     85.5     82.9     80.2     77.4     74.3     70.9     67.1     CH47   IN 2
       62.9     58.5     54.7     50.7     46.4     41.7     36.7     31.5     CH47   IN 3
          607009       30100.6    98.6     96.5     94.4     92.2     89.9     CH47   IN 4
       87.6     85.2     82.6     79.9     77.1     74.0     70.6     66.8     CH47   IN 5
       62.6     58.2     54.4     50.4     46.1     41.4     36.4     31.2     CH47   IN 6
          607009       60100.6    98.6     96.5     94.4     92.2     89.9     CH47   IN 7
       87.6     85.2     83.6     79.9     77.1     74.0     70.6     66.8     CH47   IN 8
       62.6     58.2     54.4     50.4     46.1     41.4     36.4     31.2     CH47   IN 9
          607009        9098.1    96.1     94.0     91.9     89.7     87.4     CH47   IN10
       85.1     82.7     80.1     77.4     74.6     71.5     68.1     64.3     CH47   IN11
       60.1     55.7     51.9     47.9     43.6     38.9     33.9     28.7     CH47   IN12
          607009       12098.9    96.9     94.8     92.7     90.5     88.2     CH47   IN13
       85.9     83.5     80.9     78.2     75.4     72.3     68.9     65.1     CH47   IN14
       60.9     56.5     52.7     48.7     44.4     39.7     34.7     29.5     CH47   IN15
          607009       15097.9    95.9     93.8     91.7     89.5     87.2     CH47   IN16
       84.9     82.5     79.9     77.2     73.4     70.3     67.9     64.1     CH47   IN17
       59.9     55.5     51.7     47.7     43.4     38.7     33.7     28.5     CH47   IN18
          607009       18094.2    92.2     90.1     88.0     85.8     83.5     CH47   IN19
       81.3     78.8     76.2     73.5     70.7     67.6     64.2     60.4     CH47   IN20
       56.2     51.8     48.0     44.0     39.7     35.0     30.0     24.8     CH47   IN
COMMENT 607008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 607008 HELICOPTER - CH-47
AL        607008         099.4    97.3     95.2     93.1     91.0     88.7     CH47 OUT 1
       86.4     84.1     81.6     79.0     76.3     73.3     70.1     66.4     CH47 OUT 2
       62.3     57.9     54.2     50.1     44.7     40.8     35.6     30.0     CH47 OUT 3
```

```
  607008      30100.6   98.5   96.4   94.3   92.2   89.9    CH47 OUT 4
87.6    85.3    82.8    80.2   77.5   74.5   71.3   67.6    CH47 OUT 5
63.5    59.1    55.4    51.3   45.9   42.0   36.8   31.2    CH47 OUT 6

  607008      60103.1   101.0  98.9   96.8   94.7   92.4    CH47 OUT 7
90.1    87.8    85.3    82.7   80.0   77.0   73.8   70.1    CH47 OUT 8
66.0    61.6    57.9    53.8   48.4   44.5   39.3   33.7    CH47 OUT 9

  607008      90101.    99.7   97.6   95.5   93.4   91.1    CH47 OUT10
88.8    86.5    84.0    81.4   78.7   75.7   72.5   68.8    CH47 OUT11
64.7    60.3    56.6    52.5   47.1   43.2   38.0   32.4    CH47 OUT12
  607008     120101.0   98.9   95.8   94.7   92.6   90.3    CH47 OUT13
88.0    85.7    83.2    80.6   77.9   74.9   71.7   68.0    CH47 OUT14
63.9    59.5    55.8    51.7   46.3   42.4   37.2   31.6    CH47 OUT15
  607008      15098.7   96.6   94.5   92.4   90.3   88.0    CH47 OUT16
85.7    83.4    80.9    78.3   75.6   72.6   69.4   65.7    CH47 OUT17
61.6    57.2    53.5    49.4   44.0   40.1   34.9   29.3    CH47 OUT18
  607008    180101.3    99.2   97.1   95.0   92.9   90.6    CH47 OUT19
88.3    86.0    83.5    80.9   78.2   75.2   72.0   68.3    CH47 OUT20
64.2    59.8    56.1    52.0   46.6   41.7   37.5   31.9    CH47 OUT
```

The next part of the DRIVER input file will contain DRIVER instructions. It is easier to check the input if the input is grouped by instruction type. Put the $RUNWY instructions first. The $RUNWY instruction needs the following information:

1. The heading of the runway
2. A unique runway number (to differentiate parallel runways)
3. The coordinate of the ends of the runway
4. The takeoff and landing displacements

Note from the map (Figure 5) that there are three parallel runways running east-west. Also note that the northern-most runway is numbered 1, the runway in the middle is numbered 2, and the southern-most runway is numbered 3. These numbers will be used as the runway numbers of the runways heading west to east on the $RUNWY cards. The reciprocal runways (the same physical runways, but heading in the opposite direction) are logically different runways. Different logical runways need different runway numbers. The difference between the runway numbers of reciprocal runways is 9. Thus runway 10 is the reciprocal of runway 1, runways 11 and 2 are reciprocals, and runways 12 and 3 are reciprocals. Runways 1, 2, and 3 are parallel runways heading west to east. Runways 10, 11,and 12 are parallel runways heading east to west.

The heading tells the orientation of the runway with respect to magnetic north. Magnetic north is 36. Other headings are computed by first finding the clockwise angle, in degrees, between magnetic north and the runway (making sure the vertex of the angle is the start of the runway). Divide the angle by 10 and round to the nearest integer to get the heading. For example, runway 1 is computed as follows. The clockwise angle between due north and runway 1 is 90.0 degrees (90/10 = 9). This number (9) is 9 when rounded to the nearest

integer. Thus, the heading of runway 1 (west to east) is 9. The clockwise angle between due north and runway 10 (the reciprocal of runway 1 is 270 degrees (270/10 = 27). Twenty-seven rounded to the nearest integer, is 27.

Because runways 1, 2, and 3 are parallel, they all have the same headings. Similarly, runways 10, 11, and 12 have the same headings. (The data sheet also gives the heading(s) of the runways.)

The map shows that the coordinates of the ends of runway 1 are (43120, 52150) and (57120, 52150). The coordinates of the ends of runway 2 are (43120, 50020) and (57120, 50020), and the coordinates of the ends of runway 3 (43120, 48950) and (57120, 48950). All the helicopters takeoff and land from the same spot in the middle of the runway, so that the default values (half of the length of the runway) for the takeoff and landing displacements are the right values. Since the default values are being used for the takeoff and landing displacements, each runway has to be entered only once. (The information for the reciprocal runways will be put into the library automatically.) Thus the $RUNWY instructions are as follows:

	HEAD NUM	START X	START Y	END X	END Y
$RUNWY9	1	43102	51150	57120	51150
$RUNWY92	2	43120	50020	57120	50020
$RUNWY9	3	43120	48950	57120	48950

The next group of instructions is $TABLE. (Remember that each $TABLE instruction requires 7 cards.) Most of the information for the $TABLE instructions is on the data sheet (Figure 4). Note that (1) there are two different descent glide slopes, so two $TABLE instructions are needed and (2) the lengths of the segments do not include the turn radius (i.e., the lengths are measured as in Figure 1). The $TABLE instructions are often numbered consecutively, but the numbers only have to be between 1 and 20.

	LENGTH	START SPEED	END SPEED	START HEIGHT	END HEIGHT	ALPHA ID
$TABLE1						
	4600.	0.	80.	0.	400.	UPW
	5000.	80.	90.	425.	700.	CRSW
	9200.	90.	90.	700.	700.	DWNW
	5000.	90.	80.	700.	400.	BASE
	4600.	80.	0.	375.	0.	FINL
	500.	90.	5.	80.	1800.	RDUS

The other $TABLE instruction is the same as the first, except for the descent glide slope.

	LENGTH	START SPEED	END SPEED	START HEIGHT	END HEIGHT	ALPHA ID
$TABLE2						
	4600.	0.	80.	0.	400.	UPW
	5000.	80.	90.	425.	700.	CRSW
	9200.	90.	90.	700.	700.	DWNW
	5000.	90.	80.	700.	400.	BASE
	4600.	80.	0.	375.	0.	FINL
	500.	90.	7.	80.	1800.	RDUS

The next group are $ACTON instructions. The $ACTON instructions tell DRIVER which runway, flight pattern, and helicopter to use, and the average number of operations, separated into day and night. It is easier for the user to group the $ACTON instructions by runway. Also DRIVER and NOISEMAP3.4 work more efficiently with this organization.

All runways use both pattern definitions (the $TABLE instructions, shown above) for both the UH1 helicopter and the CH47 helicopter. Runway 1/10 has 59 daytime iterations with a UH1 helicopter. Sixty percent are in the runway 1 (west to east) direction. So there are 59 x 60% = 35.4 UH1 daytime iterations on runway 1 (50 percent land at 5 degrees; 50 percent land at 7 degrees--the two glide slopes for runway 1). Thus runway 1 has 35.4 x 50% = 17.7 daytime iterations with a UH1 landing at 5 degrees ($TABLE 1). Similarly, there are 17.7 daytime UH1 iterations landing at 7 degrees ($TABLE 2).

Runway 1 has .02 nighttime iterations with a UH1H helicopter. Seventy percent, or .014, daytime iterations are on runway 1 (as opposed to runway 10) (half land at 5 degrees; half land at 7 degrees). Thus, runway 1 has .007 nighttime iterations with a UH1 landing at 5 degrees ($TABLE 1), and .007 landing at 7 degrees ($TABLE 2).

Runway 1/10 has 17.7 daytime iterations with a CH47 helicopter. Sixty percent, or 10.62, are in the runway 1 direction (half land at 5 degrees; half land at 7 degrees). Thus, runway 1 has 5.31 daytime iterations with a CH47 landing at 5 degrees ($TABLE 1), and 5.31 landing at 7 degrees ($TABLE 2). There are no nighttime iterations with a CH47.

When a pilot takes off from runway 1/10, he/she turns north to avoid the helicopters taking off from the other runways. In other words, a pilot turns left from runway 1, and turns right from runway 10. The $ACTON instructions for runway 1 are as follows:

RUNWAY HEADING	RUNWAY NUMBER	FLIGHT DESCRIP NUMBER	DAY ITER'S	NIGHT ITER'S	CRAFT ALPHA ID	DIR OF TURN
$ACTON9	1	1	17.7	.007	UH1H	LHP
$ACTON9	1	2	17.7	.007	UH1H	LHP
$ACTON9	1	1	5.31	0.	CH47	LHP
$ACTON9	1	2	5.31	0.	CH47	LHP

Runway 1/10 has 59 daytime UH1 helicopter iterations. Forty percent, or 23.6, daytime iterations are in the runway 10 direction (half land at each of

the descent glide slopes). Thus, runway 10 has 11.8 daytime UH1 helicopter iterations landing at 5 degrees ($TABLE 1), and 11.8 landing at 7 degrees ($TABLE 2).

Runway 1/10 has .02 nighttime UH1 helicopter iterations. Thirty percent, or .006, nighttime iterations are in the runway 10 direction (half land at 5 degrees; half at 7 degrees). Thus, runway 10 has .003 nighttime UH1 iterations landing at 5 degrees ($TABLE 1), and .003 landing at 7 degrees ($TABLE 2).

Runway 1/10 has 17.7 daytime CH47 helicopter iterations. Forty percent, or 7.08, daytime iterations are in the runway 10 direction (half land at 5 degrees; half land at 7 degrees). Thus, runway 10 has 3.54 daytime CH47 iterations landing at 5 degrees ($TABLE 1), and 3.54 landing at 7 degrees ($TABLE 2). There are no nighttime iterations with a CH47. (Remember, the pilot turns right from runway 10.) The $ACTON instructions for runway 10 are as follows:

RUNWAY HEADING	RUNWAY NUMBER	FLIGHT DESCRIP NUMBER	DAY ITER'S	NIGHT ITER'S	CRAFTDIR ALPHA OF ID PAT
$ACTON27	10	1	11.8	.003	UH1HRHP
$ACTON27	10	2	11.8	.003	UH1HRHP
$ACTON27	10	1	3.54	0.	CH47RHP
$ACTON27	10	2	3.54	0.	CH47RHP

When a pilot takes off from runway 3/12, he/she turns to the south to avoid the helicopters taking off from the other runways. Turning south means that a pilot turns right from runway 3, and turns left from runway 12. Runway 3/12 is an exact mirror image of runway 1/10. Therefore, the only differences between the $ACTON instructions for runway 1/10 and runway 3/12 are the direction of the turns and the runway number. The $ACTON instructions for runway 3/12 are as follow:

RUNWAY HEADING	RUNWAY NUMBER	FLIGHT DESCRIP NUMBER	DAY ITER'S	NIGHT ITER'S	CRAFTDIR ALPHA OF ID PAT
$ACTON9	3	1	17.7	.007	UH1HRHP
$ACTON9	3	2	17.7	.007	UH1HRHP
$ACTON9	3	1	5.31	0.	CH47RHP
$ACTON9	3	2	5.31	0.	CH47RP
$ACTON27	12	1	3.54	0.	CH47LHP
$ACTON27	12	2	3.54	0.	CH47LHP
$ACTON27	12	1	11.8	.003	UH1HLHP
$ACTON27	12	2	11.8	.003	UH1HLHP

Runway 2/11 is between runway 1/10 and runway 3/12. Pilots of helicopters taking off from Runway 2/11 must be careful to avoid colliding with aircraft leaving the other two runways. Since there is no set traffic pattern when

taking off from Runway 2/11, assume half of the helicopters should turn right and half should turn left. Thus the $ACTON instructions for runway 2/11 are similar to the $ACTON instructions for runways 1/10 and 3/12, except that runway numbers are different and the number of operations are only half as much. (But there are twice as many $ACTON instructions for runway 2/11 as for either of the others.) The $ACTON instructions for runway 2/11 are as follows:

RUNWAY HEADING	RUNWAY NUMBER	FLIGHT DESCRIP NUMBER	DAY ITER'S	NIGHT ITER'S	CRAFTDIR ALPHA OF ID PAT
$ACTON9	2	1	8.85	.0035	UH1HLHP
$ACTON9	2	2	8.85	.0035	UH1HLHP
$ACTON9	2	1	2.655	0.	CH47LHP
$ACTON9	2	2	2.655	0.	CH47LHP
$ACTON9	2	1	2.655	0.	CH47RHP
$ACTON9	2	2	2.655	0.	CH47RHP
$ACTON9	2	1	8.85	.0035	UH1HRHP
$ACTON9	2	2	8.85	.0035	UH1HRHP
$ACTON27	11	1	5.9	.0015	UH1HRHP
$ACTON27	11	2	5.9	.0015	UH1HRHP
$ACTON27	11	1	1.77	0.	CH47RHP
$ACTON27	11	2	1.77	0.	CH47RHP
$ACTON27	11	1	1.77	0.	CH47LHP
$ACTON27	11	2	1.77	0.	CH47LHP
$ACTON27	11	1	5.9	.0015	UH1HLHP
$ACTON27	11	2	5.9	.0015	UH1HLHP

The $ACTON instructions are the last of the DRIVER input. The cards at the end of the NOISEMAP3.4 input files should now be entered into the DRIVER input file. DRIVER will copy them unchanged into the output file. This example gets a grid as output. The NOISEMAP3.4 instruction to do this is the DMPGRD instruction:

```
DMPGRD15.                                                      PRNT
```

An END instruction must be the last card in the file. The complete file is as follows:

```
AIRFLD0.0     0.0      0.0      8.      1000.                          EAST
    EXAMPLE 1
PROCES
COMMENT 6241 - TAKEOFF,FLYOVER - UH-1H
SEL   6241.   1.       93.7     92.5     91.0     89.6    88.1    86.7    UH1H TO  1
      84.9    83.5     82.0     80.2     79.3     76.1    73.7    70.5    UH1H TO  2
      67.6    64.5     61.0     58.0     54.8     51.1    47.3    43.2    UH1H TO  3
      6241.   2.       98.7     97.5     96.0     94.6    93.2    91.9    UH1H TO  4
      90.3    89.0     87.7     86.4     85.0     83.6    82.3    80.6    UH1H TO  5
      79.0    77.1     75.1     73.3     71.1     68.5    66.1    63.4    UH1H TO
COMMENT 6242 - FLYOVER WITH IMPULSIVENESS CORRECTION
```

COMMENT 6242 - HELICOPTER UH-1H									
SEL	6242.	1.	98.7	97.5	96.0	94.6	93.1	91.7	UH1H FO 1
	89.9	88.4	86.6	84.3	81.7	78.8	75.4	70.8	UH1H FO 2
	67.6	64.5	61.0	58.0	54.8	51.1	47.3	43.2	UH1H FO 3
	6242.	2.	103.7	102.5	101.0	99.6	98.2	96.9	UH1H FO 4
	95.3	93.9	92.3	90.5	88.4	86.3	84.0	80.9	UH1H FO 5
	79.0	77.1	75.1	73.3	71.1	68.5	66.1	63.4	UH1H FO
COMMENT 6245 - APPROACH - UH-1H									
SEL	6245.	1.	99.9	98.7	97.1	95.6	94.0	92.4	UH1HLAND 1
	90.6	88.9	87.3	85.4	83.4	81.1	78.5	75.2	UH1HLAND 2
	72.1	68.8	65.2	62.1	58.8	55.0	51.2	46.9	UH1HLAND 3
	6245.	2.	104.9	103.7	102.1	100.6	99.1	97.6	UH1HLAND 4
	96.0	94.4	93.0	91.6	90.1	88.6	87.1	85.3	UH1HLAND 5
	83.5	81.4	79.3	77.4	75.1	72.4	70.0	67.1	UH1HLAND
COMMENT 6246 - APPROACH WITH IMPULSIVENESS CORRECTION									
COMMENT 6246 - HELICOPTER - UH-1H									
SEL	6246.	1.	104.9	103.7	102.1	100.6	99.0	97.4	UH1HLAND 1
	95.6	93.8	91.9	89.5	86.8	83.8	80.2	75.5	UH1HLAND 2
	72.1	68.8	65.2	62.1	58.8	55.0	51.2	46.9	UH1HLAND 3
	6246.	2.	109.9	108.7	107.1	105.6	104.1	102.6	UH1HLAND 4
	101.0	99.3	97.6	95.7	93.5	91.3	88.8	85.6	UH1HLAND 5
	83.5	81.4	79.3	77.4	75.1	72.4	70.0	67.1	UH1HLAND
COMMENT 624009 HOVER-IN-GROUND EFFECT									
COMMENT 624009 HELICOPTER - UH-1H									
AL	624009		091.0	88.9	86.9	84.8	82.6	80.4	UH1H IN 1
	78.2	75.8	73.4	70.8	68.1	65.1	61.8	58.1	UH1H IN 2
	53.9	49.5	45.8	41.8	37.4	32.7	27.5	22.1	UH1H IN 3
	624009		3089.8	87.7	85.7	83.6	81.4	79.2	UH1H IN 4
	77.0	74.6	72.2	69.6	66.9	63.9	60.6	56.9	UH1H IN 5
	52.7	48.3	44.6	40.6	36.2	31.5	26.3	20.9	UH1H IN 6
	624009		6091.3	89.2	87.2	85.1	82.9	80.7	UH1H IN 7
	78.5	76.1	73.7	71.1	68.4	65.4	62.1	58.4	UH1H IN 8
	54.2	49.8	46.1	42.1	37.7	33.0	27.8	22.4	UH1H IN 9
	624009		9090.7	88.6	86.6	84.5	82.3	80.1	UH1H IN10
	77.9	75.5	73.1	70.5	67.8	64.9	61.5	57.8	UH1H IN11
	53.6	49.2	45.5	41.5	37.1	32.4	27.2	21.8	UH1H IN12
	624009		12093.0	90.9	88.9	86.8	84.6	82.4	UH1H IN13
	80.2	77.8	75.4	72.8	70.1	67.2	63.8	60.1	UH1H IN14
	55.9	51.5	47.8	43.8	37.4	34.7	29.5	23.1	UH1H IN15
	624009		15096.8	94.7	92.7	90.6	88.4	86.2	UH1H IN16
	84.0	81.6	79.2	76.6	73.9	71.0	67.6	63.9	UH1H IN17
	59.7	55.3	51.6	47.6	43.2	38.5	33.3	27.9	UH1H IN18
	624009		18096.5	94.4	92.4	90.3	88.1	85.9	UH1H IN19
	83.7	81.3	79.0	76.3	73.6	70.7	67.3	63.6	UH1H IN20
	59.4	55.0	51.3	47.3	42.9	38.2	33.0	27.6	UH1H IN
COMMENT 624008 HOVER-OUT-OF-GROUND EFFECT									
COMMENT 624008 HELICOPTER - UH-1H									
AL	624008		091.5	89.4	87.3	85.2	83.0	80.8	UH1H OUT 1
	78.5	76.1	73.6	71.	68.4	65.5	62.3	58.7	UH1H OUT 2
	54.6	50.3	46.4	42.2	37.6	32.6	27.2	21.5	UH1H OUT 3
	624008		3090.8	88.7	86.6	84.5	82.3	80.1	UH1H OUT 4
	77.8	75.4	72.9	70.4	67.7	64.8	61.6	58.0	UH1H OUT 5
	53.9	49.6	45.7	41.5	36.9	31.9	26.5	20.8	UH1H OUT 6
	624008		6093.1	91.0	88.9	86.8	84.6	82.4	UH1H OUT 7

```
        80.1    77.7    75.2    72.7    70.0    67.1    63.9    60.3    UH1H OUT 8
        56.2    51.9    48.0    43.8    39.2    34.2    28.8    23.1    UH1H OUT 9
          624008       9093.5   91.4    89.3    87.2    85.0    82.8    UH1H OUT10
        80.5    78.1    75.6    73.1    70.4    67.5    64.3    60.7    UH1H OUT11
        56.6    52.3    48.4    44.2    39.6    34.6    29.2    23.5    UH1H OUT12
          624008      12097.1   95.0    92.9    90.8    88.6    86.4    UH1H OUT13
        84.1    81.7    79.2    76.7    74.0    71.1    67.9    64.3    UH1H OUT14
        60.2    55.9    52.0    47.8    43.2    38.2    32.8    22.1    UH1H OUT15
          624008      150101.2  99.1    97.0    94.9    92.7    90.5    UH1H OUT16
        88.2    85.8    83.3    80.8    78.1    75.2    72.0    68.4    UH1H OUT17
        64.3    60.0    56.1    51.9    47.3    42.3    36.9    31.2    UH1H OUT18
          624008      18099.1   97.0    94.9    92.8    90.6    88.4    UH1H OUT19
        86.1    83.7    81.2    78.7    76.0    73.1    69.9    66.3    UH1H OUT20
        62.2    57.9    54.0    49.8    45.2    40.2    34.8    29.1    UH1H OUT
COMMENT 6071 - TAKEOFF,FLYOVER - CH-47
SEL     6071.   1.      96.1    94.6    93.3    91.9    90.5    88.9    CH47 TO  1
        87.3    85.8    84.2    82.3    80.4    78.2    75.8    73.1    CH47 TO  2
        70.1    67.0    63.5    60.3    56.6    52.5    48.6    44.7    CH47 TO  3
        6071.   2.      101.1   99.6    98.3    96.9    95.7    94.2    CH47 TO  4
        92.9    91.7    90.5    89.2    87.9    86.6    85.2    83.7    CH47 TO  5
        82.3    80.5    78.8    77.1    75.1    72.7    70.4    67.8    CH47 TO
COMMENT 6072 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6072 - HELICOPTER CH-47
SEL     6072.   1.      101.1   99.6    98.3    96.9    95.5    93.9    CH47 FO  1
        92.3    90.7    88.8    86.4    83.8    80.9    77.5    73.4    CH47 FO  2
        70.1    67.0    63.5    60.3    56.6    52.5    48.6    44.7    CH47 FO  3
        6072.   2.      106.1   104.6   103.3   101.9   100.7   99.2    CH47 FO  4
        97.9    96.6    95.1    93.3    91.3    89.3    86.9    84.0    CH47 FO  5
        82.3    80.5    78.8    77.1    75.1    72.7    70.4    67.8    CH47 FO
COMMENT 6075 - APPROACH - CH-47
SEL     6075.   1.      102.3   100.8   99.4    97.9    96.4    94.6    CH47LAND 1
        92.8    91.2    89.5    87.5    85.5    83.2    80.6    77.8    CH47LAND 2
        74.6    71.3    67.7    64.4    60.6    56.4    52.5    48.4    CH47LAND 3
        6075.   2.      107.3   105.8   104.4   102.9   101.6   99.9    CH47LAND 4
        98.4    97.1    95.8    94.4    93.0    91.6    90.0    88.4    CH47LAND 5
        86.8    84.8    83.0    81.2    79.1    76.6    74.3    71.5    CH47LAND
COMMENT 6076 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6076 - HELICOPTER - CH-47
SEL     6076.   1.      107.3   105.8   104.4   102.9   101.4   99.6    CH47LAND 1
        97.8    96.1    94.1    91.6    88.9    85.9    82.3    78.1    CH47LAND 2
        74.6    71.3    67.7    64.4    60.6    56.4    52.5    48.4    CH47LAND 3
        6076.   2.      112.3   110.8   109.4   107.9   106.6   104.9   CH47LAND 4
        103.4   102.0   100.4   98.5    96.4    94.3    91.7    88.7    CH47LAND 5
        86.8    84.8    83.0    81.2    79.1    76.6    74.3    71.5    CH47LAND
COMMENT 607009 HOVER-IN-GROUND EFFECT
COMMENT 607009 HELICOPTER - CH-47
AL        607009        0100.9  98.9    96.8    94.7    92.5    90.2    CH47  IN 1
        87.9    85.5    82.9    80.2    77.4    74.3    70.9    67.1    CH47  IN 2
        62.9    58.5    54.7    50.7    46.4    41.7    36.7    31.5    CH47  IN 3
          607009       30100.6  98.6    96.5    94.4    92.2    89.9    CH47  IN 4
        87.6    85.2    82.6    79.9    77.1    74.0    70.6    66.8    CH47  IN 5
        62.6    58.2    54.4    50.4    46.1    41.4    36.4    31.2    CH47  IN 6
          607009       60100.6  98.6    96.5    94.4    92.2    89.9    CH47  IN 7
        87.6    85.2    83.6    79.9    77.1    74.0    70.6    66.8    CH47  IN 8
```

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          62.6      58.2      54.4      50.4      46.1      41.4      36.4      31.2      CH47  IN 9
            607009        9098.1      96.1      94.0      91.9      89.7      87.4      CH47  IN10
          85.1      82.7      80.1      77.4      74.6      71.5      68.1      64.3      CH47  IN11
          60.1      55.7      51.9      47.9      43.6      38.9      33.9      28.7      CH47  IN12
            607009       12098.9      96.9      94.8      92.7      90.5      88.2      CH47  IN13
          85.9      83.5      80.9      78.2      75.4      72.3      68.9      65.1      CH47  IN14
          60.9      56.5      52.7      48.7      44.4      39.7      34.7      29.5      CH47  IN15
            607009       15097.9      95.9      93.8      91.7      89.5      87.2      CH47  IN16
          84.9      82.5      79.9      77.2      73.4      70.3      67.9      64.1      CH47  IN17
          59.9      55.5      51.7      47.7      43.4      38.7      33.7      28.5      CH47  IN18
            607009       18094.2      92.2      90.1      88.0      85.8      83.5      CH47  IN19
          81.3      78.8      76.2      73.5      70.7      67.6      64.2      60.4      CH47  IN20
          56.2      51.8      48.0      44.0      39.7      35.0      30.0      24.8      CH47  IN
COMMENT 607008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 607008 HELICOPTER - CH-47
AL          607008          099.4      97.3      95.2      93.1      91.0      88.7      CH47 OUT 1
          86.4      84.1      81.6      79.0      76.3      73.3      70.1      66.4      CH47 OUT 2
          62.3      57.9      54.2      50.1      44.7      40.8      35.6      30.0      CH47 OUT 3
            607008        30100.6     98.5      96.4      94.3      92.2      89.9      CH47 OUT 4
          87.6      85.3      82.8      80.2      77.5      74.5      71.3      67.6      CH47 OUT 5
          63.5      59.1      55.4      51.3      45.9      42.0      36.8      31.2      CH47 OUT 6
            607008        60103.1     101.0     98.9      96.8      94.7      92.4      CH47 OUT 7
          90.1      87.8      85.3      82.7      80.0      77.0      73.8      70.1      CH47 OUT 8
          66.0      61.6      57.9      53.8      48.4      44.5      39.3      33.7      CH47 OUT 9
            607008         90101.     99.7      97.6      95.5      93.4      91.1      CH47 OUT10
          88.8      86.5      84.0      81.4      78.7      75.7      72.5      68.8      CH47 OUT11
          64.7      60.3      56.6      52.5      47.1      43.2      38.0      32.4      CH47 OUT12
            607008       120101.0     98.9      95.8      94.7      92.6      90.3      CH47 OUT13
          88.0      85.7      83.2      80.6      77.9      74.9      71.7      68.0      CH47 OUT14
          63.9      59.5      55.8      51.7      46.3      42.4      37.2      31.6      CH47 OUT15
            607008       15098.7      96.6      94.5      92.4      90.3      88.0      CH47 OUT16
          85.7      83.4      80.9      78.3      75.6      72.6      69.4      65.7      CH47 OUT17
          61.6      57.2      53.5      49.4      44.0      40.1      34.9      29.3      CH47 OUT18
            607008       180101.3     99.2      97.1      95.0      92.9      90.6      CH47 OUT19
          88.3      86.0      83.5      80.9      78.2      75.2      72.0      68.3      CH47 OUT20
          64.2      59.8      56.1      52.0      46.6      41.7      37.5      31.9      CH47 OUT
$RUNWY9             1         43120     51150     57120     51150
$RUNWY9             2         43120     50020     57120     50020
$RUNWY9             3         43120     48950     57120     48950
$TABLE1
          4600.     0.        80.       0.        400.                                  UPW
          5000.     80.       90.       425.      700.                                  CRSW
          9200.     90.       90.       700.      700.                                  DWNW
          5000.     90.       80.       700.      400.                                  BASE
          4600.     80.       0.        375.      0.                                    FINL
          500.      90.       5.        80.       1800.                                 RDUS
$TABLE2
          4600.     0.        80.       0.        400.                                  UPW
          5000.     80.       90.       425.      700.                                  CRSW
          9200.     90.       90.       700.      700.                                  DWNW
          5000.     90.       80.       700.      400.                                  BASE
          4600.     80.       0.        375.      0.                                    FINL
          500.      90.       7.        80.       1800.                                 RDUS
$ACTON9             1         1         17.7      .007                                  UH1HLHP
```

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$ACTON9      1    2    17.7    .007                    UH1HLHP
$ACTON9      1    1    5.31    0.                      CH47LHP
$ACTON9      1    2    5.31    0.                      CH47LHP
$ACTON27     10   1    3.54    0.                      CH47RHP
$ACTON27     10   2    3.54    0.                      CH47RHP
$ACTON27     10   1    11.8    .003                    UH1HRHP
$ACTON27     10   2    11.8    .003                    UH1HRHP
$ACTON9      3    1    17.7    .007                    UH1HRHP
$ACTON9      3    2    17.7    .007                    UH1HRHP
$ACTON9      3    1    5.31    0.                      CH47RHP
$ACTON9      3    2    5.31    0.                      CH47RHP
$ACTON27     12   1    3.54    0.                      CH47LHP
$ACTON27     12   2    3.54    0.                      CH47LHP
$ACTON27     12   1    11.8    .003                    UH1HLHP
$ACTON27     12   2    11.8    .003                    UH1HLHP
$ACTON9      2    1    8.85    .0035                   UH1HLHP
$ACTON9      2    2    8.85    .0035                   UH1HLHP
$ACTON9      2    1    2.665   0.                      CH47LHP
$ACTON9      2    2    2.665   0.                      CH47LHP
$ACTON9      2    1    2.665   0.                      CH47RHP
$ACTON9      2    2    2.665   0.                      CH47RHP
$ACTON9      2    1    8.85    .0035                   UH1HRHP
$ACTON9      2    2    8.85    .0035                   UH1HRHP
$ACTON27     11   1    5.9     .0015                   UH1HRHP
$ACTON27     11   2    5.9     .0015                   UH1HRHP
$ACTON27     11   1    1.77    0.                      CH47RHP
$ACTON27     11   2    1.77    0.                      CH47RHP
$ACTON27     11   1    1.77    0.                      CH47LHP
$ACTON27     11   2    1.77    0.                      CH47LHP
$ACTON27     11   1    5.9     .0015                   UH1HLHP
$ACTON27     11   2    5.9     .0015                   UH1HLHP
DMPGRD15.                                               PRNT
END
```

The informative DRIVER output is as follows:

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****************     NOISEMAP3.4 DRIVER PROGRAM FOR HELICOPTERS     ****************


          DEFAULT IMPULSE CORRECTIONS ARE IN EFFECT

          TYPE OF FLIGHT              IMPULSE CORRECTED?
          --------------              ------------------
          CLIMBING                          YES
          LEVEL                             YES
          DESCENDING                        YES
```

```
AIRFLD0.0     0.0      0.0      8.       1000.                                EAST
     EXAMPLE 1
PROCES
SEL   6241.   1.       93.7     92.5     91.0     89.6     88.1     86.7     UH1H TO  1
      84.9    83.5     82.0     80.2     79.3     76.1     73.7     70.5     UH1H TO  2
      67.6    64.5     61.0     58.0     54.8     51.1     47.3     43.2     UH1H TO  3
      6241.   2.       98.7     97.5     96.0     94.6     93.2     91.9     UH1H TO  4
      90.3    89.0     87.7     86.4     85.0     83.6     82.3     80.6     UH1H TO  5
      79.0    77.1     75.1     73.3     71.1     68.5     66.1     63.4     UH1H TO
COMMENT 6242 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6242 - HELICOPTER UH-1H
SEL   6242.   1.       98.7     97.5     96.0     94.6     93.1     91.7     UH1H FO  1
      89.9    88.4     86.6     84.3     81.7     78.8     75.4     70.8     UH1H FO  2
      67.6    64.5     61.0     58.0     54.8     51.1     47.3     43.2     UH1H FO  3
      6242.   2.       103.7    102.5    101.0    99.6     98.2     96.9     UH1H FO  4
      95.3    93.9     92.3     90.5     88.4     86.3     84.0     80.9     UH1H FO  5
      79.0    77.1     75.1     73.3     71.1     68.5     66.1     63.4     UH1H FO
COMMENT 6245 - APPROACH - UH-1H
SEL   6245.   1.       99.9     98.7      97.1    95.6     94.0     92.4     UH1HLAND 1
      90.6    88.9     87.3     85.4     83.4     81.1     78.5     75.2     UH1HLAND 2
      72.1    68.8     65.2     62.1     58.8     55.0     51.2     46.9     UH1HLAND 3
      6245.   2.       104.9    103.7    102.1    100.6    99.1     97.6     UH1HLAND 4
      96.0    94.4     93.0     91.6     90.1     88.6     87.1     85.3     UH1HLAND 5
      83.5    81.4     79.3     77.4     75.1     72.4     70.0     67.1     UH1HLAND
COMMENT 6246 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6246 - HELICOPTER - UH-1H
SEL   6246.   1.       104.9    103.7    102.1    100.6    99.0     97.4     UH1HLAND 1
      95.6    93.8     91.9     89.5     86.8     83.8     80.2     75.5     UH1HLAND 2
      72.1    68.8     65.2     62.1     58.8     55.0     51.2     46.9     UH1HLAND 3
      6246.   2.       109.9    108.7    107.1    105.6    104.1    102.6    UH1HLAND 4
      101.0   99.3     97.6     95.7     93.5     91.3     88.8     85.6     UH1HLAND 5
      83.5    81.4     79.3     77.4     75.1     72.4     70.0     67.1     UH1HLAND
COMMENT 624009 HOVER-IN-GROUND EFFECT
COMMENT 624009 HELICOPTER - UH-1H
AL      624009        091.0     88.9     86.9     84.8     82.6     80.4     UH1H   IN 1
      78.2    75.8     73.4     70.8     68.1     65.1     61.8     58.1     UH1H   IN 2
      53.9    49.5     45.8     41.8     37.4     32.7     27.5     22.1     UH1H   IN 3
        624009       3089.8     87.7     85.7     83.6     81.4     79.2     UH1H   IN 4
      77.0    74.6     72.2     69.6     66.9     63.9     60.6     56.9     UH1H   IN 5
      52.7    48.3     44.6     40.6     36.2     31.5     26.3     20.9     UH1H   IN 6
        624009       6091.3     89.2     87.2     85.1     82.9     80.7     UH1H   IN 7
      78.5    76.1     73.7     71.1     68.4     65.4     62.1     58.4     UH1H   IN 8
      54.2    49.8     46.1     42.1     37.7     33.0     27.8     22.4     UH1H   IN 9
        624009       9090.7     88.6     86.6     84.5     82.3     80.1     UH1H   IN10
      77.9    75.5     73.1     70.5     67.8     64.9     61.5     57.8     UH1H   IN11
      53.6    49.2     45.5     41.5     37.1     32.4     27.2     21.8     UH1H   IN12
        624009      12093.0     90.9     88.9     86.8     84.6     82.4     UH1H   IN13
      80.2    77.8     75.4     72.8     70.1     67.2     63.8     60.1     UH1H   IN14
      55.9    51.5     47.8     43.8     37.4     34.7     29.5     23.1     UH1H   IN15
        624009      15096.8     94.7     92.7     90.6     88.4     86.2     UH1H   IN16
      84.0    81.6     79.2     76.6     73.9     71.0     67.6     63.9     UH1H   IN17
      59.7    55.3     51.6     47.6     43.2     38.5     33.3     27.9     UH1H   IN18
        624009      18096.5     94.4     92.4     90.3     88.1     85.9     UH1H   IN19
      83.7    81.3     79.0     76.3     73.6     70.7     67.3     63.6     UH1H   IN20
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      59.4    55.0    51.3    47.3    42.9    38.2    33.0    27.6    UH1H  IN
COMMENT 624008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 624008 HELICOPTER - UH-1H
AL      624008       091.5    89.4    87.3    85.2    83.0    80.8    UH1H OUT 1
      78.5    76.1    73.6    71.1    68.4    65.5    62.3    58.7    UH1H OUT 2
      54.6    50.3    46.4    42.2    37.6    32.6    27.2    21.5    UH1H OUT 3
        624008      3090.8    88.7    86.6    84.5    82.3    80.1    UH1H OUT 4
      77.8    75.4    72.9    70.4    67.7    64.8    61.6    58.0    UH1H OUT 5
      53.9    49.6    45.7    41.5    36.9    31.9    26.5    20.8    UH1H OUT 6
        624008      6093.1    91.0    88.9    86.8    84.6    82.4    UH1H OUT 7
      80.1    77.7    75.2    72.7    70.0    67.1    63.9    60.3    UH1H OUT 8
      56.2    51.9    48.0    43.8    39.2    34.2    28.8    23.1    UH1H OUT 9
        624008      9093.5    91.4    89.3    87.2    85.0    82.8    UH1H OUT10
      80.5    78.1    75.6    73.1    70.4    67.5    64.3    60.7    UH1H OUT11
      56.6    52.3    48.4    44.2    39.6    34.6    29.2    23.5    UH1H OUT12
        624008     12097.1    95.0    92.9    90.8    88.6    86.4    UH1H OUT13
      84.1    81.7    79.2    76.7    74.0    71.1    67.9    64.3    UH1H OUT14
      60.2    55.9    52.0    47.8    43.2    38.2    32.8    22.1    UH1H OUT15
        624008     150101.2   99.1    97.0    94.9    92.7    90.5    UH1H OUT16
      88.2    85.8    83.3    80.8    78.1    75.2    72.0    68.4    UH1H OUT17
      64.3    60.0    56.1    51.9    47.3    42.3    36.9    31.2    UH1H OUT18
        624008     18099.1    97.0    94.9    92.8    90.6    88.4    UH1H OUT19
      86.1    83.7    81.2    78.7    76.0    73.1    69.9    66.3    UH1H OUT20
      62.2    57.9    54.0    49.8    45.2    40.2    34.8    29.1    UH1H OUT
COMMENT 6071 - TAKEOFF,FLYOVER - CH-47
SEL   6071.   1.      96.1    94.6    93.3    91.9    90.5    88.9    CH47 TO  1
      87.3    85.8    84.2    82.3    80.4    78.2    75.8    73.1    CH47 TO  2
      70.1    67.0    63.5    60.3    56.6    52.5    48.6    44.7    CH47 TO  3
      6071.   2.      101.1   99.6    98.3    96.9    95.7    94.2    CH47 TO  4
      92.9    91.7    90.5    89.2    87.9    86.6    85.2    83.7    CH47 TO  5
      82.3    80.5    78.8    77.1    75.1    72.7    70.4    67.8    CH47 TO
COMMENT 6072 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6072 - HELICOPTER CH-47
SEL   6072.   1.      101.1   99.6    98.3    96.9    95.5    93.9    CH47 FO  1
      92.3    90.7    88.8    86.4    83.8    80.9    77.5    73.4    CH47 FO  2
      70.1    67.0    63.5    60.3    56.6    52.5    48.6    44.7    CH47 FO  3
      6072.   2.      106.1   104.6   103.3   101.9   100.7   99.2    CH47 FO  4
      97.9    96.6    95.1    93.3    91.3    89.3    86.9    84.0    CH47 FO  5
      82.3    80.5    78.8    77.1    75.1    72.7    70.4    67.8    CH47 FO
COMMENT 6075 - APPROACH - CH-47
SEL   6075.   1.      102.3   100.8   99.4    97.9    96.4    94.6    CH47LAND 1
      92.8    91.2    89.5    87.5    85.5    83.2    80.6    77.8    CH47LAND 2
      74.6    71.3    67.7    64.4    60.6    56.4    52.5    48.4    CH47LAND 3
      6075.   2.      107.3   105.8   104.4   102.9   101.6   99.9    CH47LAND 4
      98.4    97.1    95.8    94.4    93.0    91.6    90.0    88.4    CH47LAND 5
      86.8    84.8    83.0    81.2    79.1    76.6    74.3    71.5    CH47LAND
COMMENT 6076 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6076 - HELICOPTER - CH-47
SEL   6076.   1.      107.3   105.8   104.4   102.9   101.4   99.6    CH47LAND 1
      97.8    96.1    94.1    91.6    88.9    85.9    82.3    78.1    CH47LAND 2
      74.6    71.3    67.7    64.4    60.6    56.4    52.5    48.4    CH47LAND 3
      6076.   2.      112.3   110.8   109.4   107.9   106.6   104.9   CH47LAND 4
      103.4   102.0   100.4   98.5    96.4    94.3    91.7    88.7    CH47LAND 5
      86.8    84.8    83.0    81.2    79.1    76.6    74.3    71.5    CH47LAND
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COMMENT 607009 HOVER-IN-GROUND EFFECT
COMMENT 607009 HELICOPTER - CH-47
AL      607009        0100.9   98.9     96.8     94.7     92.5     90.2     CH47  IN 1
     87.9     85.5     82.9    80.2     77.4     74.3     70.9     67.1     CH47  IN 2
     62.9     58.5     54.7    50.7     46.4     41.7     36.7     31.5     CH47  IN 3
        607009       30100.6   98.6     96.5     94.4     92.2     89.9     CH47  IN 4
     87.6     85.2     82.6    79.9     77.1     74.0     70.6     66.8     CH47  IN 5
     62.6     58.2     54.4    50.4     46.1     41.4     36.4     31.2     CH47  IN 6
        607009       60100.6   98.6     96.5     94.4     92.2     89.9     CH47  IN 7
     87.6     85.2     83.6    79.9     77.1     74.0     70.6     66.8     CH47  IN 8
     62.6     58.2     54.4    50.4     46.1     41.4     36.4     31.2     CH47  IN 9
        607009       9098.1    96.1     94.0     91.9     89.7     87.4     CH47  IN10
     85.1     82.7     80.1    77.4     74.6     71.5     68.1     64.3     CH47  IN11
     60.1     55.7     51.9    47.9     43.6     38.9     33.9     28.7     CH47  IN12
        607009      12098.9    96.9     94.8     92.7     90.5     88.2     CH47  IN13
     85.9     83.5     80.9    78.2     75.4     72.3     68.9     65.1     CH47  IN14
     60.9     56.5     52.7    48.7     44.4     39.7     34.7     29.5     CH47  IN15
        607009      15097.9    95.9     93.8     91.7     89.5     87.2     CH47  IN16
     84.9     82.5     79.9    77.2     73.4     70.3     67.9     64.1     CH47  IN17
     59.9     55.5     51.7    47.7     43.4     38.7     33.7     28.5     CH47  IN18
        607009      18094.2    92.2     90.1     88.0     85.8     83.5     CH47  IN19
     81.3     78.8     76.2    73.5     70.7     67.6     64.2     60.4     CH47  IN20
     56.2     51.8     48.0    44.0     39.7     35.0     30.0     24.8     CH47  IN
COMMENT 607008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 607008 HELICOPTER - CH-47
AL      607008        099.4    97.3     95.2     93.1     91.0     88.7     CH47 OUT 1
     86.4     84.1     81.6    79.0     76.3     73.3     70.1     66.4     CH47 OUT 2
     62.3     57.9     54.2    50.1     44.7     40.8     35.6     30.0     CH47 OUT 3
        607008       30100.6   98.5     96.4     94.3     92.2     89.9     CH47 OUT 4
     87.6     85.3     82.8    80.2     77.5     74.5     71.3     67.6     CH47 OUT 5
     63.5     59.1     55.4    51.3     45.9     42.0     36.8     31.2     CH47 OUT 6
        607008       60103.1   101.0    98.9     96.8     94.7     92.4     CH47 OUT 7
     90.1     87.8     85.3    82.7     80.0     77.0     73.8     70.1     CH47 OUT 8
     66.0     61.6     57.9    53.8     48.4     44.5     39.3     33.7     CH47 OUT 9
        607008       90101.    99.7     97.6     95.5     93.4     91.1     CH47 OUT10
     88.8     86.5     84.0    81.4     78.7     75.7     72.5     68.8     CH47 OUT11
     64.7     60.3     56.6    52.5     47.1     43.2     38.0     32.4     CH47 OUT12
        607008      120101.0   98.9     95.8     94.7     92.6     90.3     CH47 OUT13
     88.0     85.7     83.2    80.6     77.9     74.9     71.7     68.0     CH47 OUT14
     63.9     59.5     55.8    51.7     46.3     42.4     37.2     31.6     CH47 OUT15
        607008      15098.7    96.6     94.5     92.4     90.3     88.0     CH47 OUT16
     85.7     83.4     80.9    78.3     75.6     72.6     69.4     65.7     CH47 OUT17
     61.6     57.2     53.5    49.4     44.0     40.1     34.9     29.3     CH47 OUT18
        607008      180101.3   99.2     97.1     95.0     92.9     90.6     CH47 OUT19
     88.3     86.0     83.5    80.9     78.2     75.2     72.0     68.3     CH47 OUT20
     64.2     59.8     56.1    52.0     46.6     41.7     37.5     31.9     CH47 OUT
```

```
+++ NEW ENTRY IN RUNWAY LIBRARY

                    RUNWAY NUMBER IS  1
                    RUNWAY HEADING IS  9
                    START OF RUNWAY IS (   43120,   51150)
                    END OF RUNWAY IS (   57120,   51150)
                    TAKEOFF THRESHOLD DISPLACEMENT IS    7000
                    LANDING THRESHOLD DISPLACEMENT IS    7000
                    LENGTH OF RUNWAY IS    14000

RECIPROCAL TO RUNWAY NUMBER  1 HAS BEEN ENTERED AS THE  2TH ENTRY OF RUNWAY LIBRARY

                    RUNWAY NUMBER IS 10
                    RUNWAY HEADING IS 27
                    START OF RUNWAY IS (   57120,   51150)
                    END OF RUNWAY IS (   43120,   51150)
                    TAKEOFF THRESHOLD DISPLACEMENT IS    7000
                    LANDING THRESHOLD DISPLACEMENT IS    7000
                    LENGTH OF RUNWAY IS    14000

+++ NEW ENTRY IN RUNWAY LIBRARY

                    RUNWAY NUMBER IS  2
                    RUNWAY HEADING IS  9
                    START OF RUNWAY IS (   43120,   50020)
                    END OF RUNWAY IS (   57120,   50020)
                    TAKEOFF THRESHOLD DISPLACEMENT IS    7000
                    LANDING THRESHOLD DISPLACEMENT IS    7000
                    LENGTH OF RUNWAY IS    14000

RECIPROCAL TO RUNWAY NUMBER  2 HAS BEEN ENTERED AS THE  4TH ENTRY OF RUNWAY LIBRARY

                    RUNWAY NUMBER IS 11
                    RUNWAY HEADING IS 27
                    START OF RUNWAY IS (   57120,   50020)
                    END OF RUNWAY IS (   43120,   50020)
                    TAKEOFF THRESHOLD DISPLACEMENT IS    7000
                    LANDING THRESHOLD DISPLACEMENT IS    7000
                    LENGTH OF RUNWAY IS    14000

+++ NEW ENTRY IN RUNWAY LIBRARY

                    RUNWAY NUMBER IS  3
                    RUNWAY HEADING IS  9
                    START OF RUNWAY IS (   43120,   48950)
                    END OF RUNWAY IS (   57120,   48950)
                    TAKEOFF THRESHOLD DISPLACEMENT IS    7000
                    LANDING THRESHOLD DISPLACEMENT IS    7000
                    LENGTH OF RUNWAY IS    14000
```

RECIPROCAL TO RUNWAY NUMBER 3 HAS BEEN ENTERED AS THE 6TH ENTRY OF RUNWAY LIBRARY

RUNWAY NUMBER IS 12
RUNWAY HEADING IS 27
START OF RUNWAY IS (57120, 48950)
END OF RUNWAY IS (43120, 48950)
TAKEOFF THRESHOLD DISPLACEMENT IS 7000
LANDING THRESHOLD DISPLACEMENT IS 7000
LENGTH OF RUNWAY IS 14000

+++ PATTERN DEFINITION TABLE (NUMBER 1)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	4600.0	0.0	80.0	0.0	400.0
CRSW	5000.0	80.0	90.0	425.0	700.0
DWNW	9200.0	90.0	90.0	700.0	700.0
BASE	5000.0	90.0	80.0	700.0	400.0
FINL	4600.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 90. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 5.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1800. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 2)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	4600.0	0.0	80.0	0.0	400.0
CRSW	5000.0	80.0	90.0	425.0	700.0
DWNW	9200.0	90.0	90.0	700.0	700.0
BASE	5000.0	90.0	80.0	700.0	400.0
FINL	4600.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 90. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 7.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1800. (FEET)

```
+++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS  9.
                    RUNWAY NUMBER IS  1.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   17.700
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .007
                    HELICOPTER IS UH1H
                    PATTERN TURNS LEFT

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  1 TAKEOFF DESCRIPTOR
==> TODSCR      624       1       1       1    1800            6242   37422UH1HPTRN *
               6246   39708                                                  UH1HPTRN
==> ALTUDE        1       0       0       0      72     400    4600    400PTRN 604 *
               7427     425   12427     700   27281     700   32281    400PTRN 604 *
              35108     375   35422     375   39708       0       0      0PTRN 604
==> DSEL         1.     0.0      0.     0.0 150000.     0.0      0.    0.0     PTRN

==> RUNWAY    43120   51150   57120   51150    7000    7000    5.00         09

==> FLTTRK     4600       0    1800     -90    5000       0    1800    -90TKOF LHP 1
               9200       0    1800     -90    5000       0    1800    -90TKOF LHP 2
               4600       0                                               TKOF LHP

==> FLIGHT      624       1            17.70     .01                      UH1H 9 1


     +++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS  9.
                    RUNWAY NUMBER IS  1.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   17.700
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .007
                    HELICOPTER IS UH1H
                    PATTERN TURNS LEFT

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  2 TAKEOFF DESCRIPTORS
==> TODSCR      624       2       2       1    1800            6242   38080UH1HPTRN *
               6246   39708                                                  UH1HPTRN
==> ALTUDE        2       0       0       0      72     400    4600    400PTRN 604 *
               7427     425   12427     700   27281     700   32281    400PTRN 604 *
              35108     375   36654     375   39708       0       0      0PTRN 604

==> FLIGHT      624       2            17.70     .01                      UH1H 9 1
```

```
+++  GENERATE "NOISEMAP3.4" CARD(S)



                 RUNWAY HEADING IS  9.
                 RUNWAY NUMBER IS  1.
                 PATTERN DEFINITION TABLE NUMBER IS  1.
                 NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    5.310
                 NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                 HELICOPTER IS CH47
                 PATTERN TURNS LEFT

    +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
         LIBRARY NOW CONTAINS  3 TAKEOFF DESCRIPTORS
==> TODSCR     607       3       1       1     1800          6072   37422CH47PTRN *
              6076   39708                                                CH47PTRN

==> FLIGHT     607       3            5.31     0.00                       CH47 9 1


    +++  GENERATE "NOISEMAP3.4" CARD(S)



                 RUNWAY HEADING IS  9.
                 RUNWAY NUMBER IS  1.
                 PATTERN DEFINITION TABLE NUMBER IS  2.
                 NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    5.310
                 NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                 HELICOPTER IS CH47
                 PATTERN TURNS LEFT

    +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
         LIBRARY NOW CONTAINS  4 TAKEOFF DESCRIPTORS
==> TODSCR     607       4       2       1     1800          6072   38080CH47PTRN *
              6076   39708                                                CH47PTRN

==> FLIGHT     607       4            5.31     0.00                       CH47 9 1
```

+++ GENERATE "NOISEMAP3.4" CARD(S)

RUNWAY HEADING IS 27.
RUNWAY NUMBER IS 10.
PATTERN DEFINITION TABLE NUMBER IS 1.
NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS 3.540
NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS 0.000
HELICOPTER IS CH47
PATTERN TURNS RIGHT

==> RUNWAY	57120	51150	43120	51150	7000	7000	5.00		27
==> FLTTRK	4600	0	1800	90	5000	0	1800	90TKOF RHP 1	
	9200	0	1800	90	5000	0	1800	90TKOF RHP 2	
	4600	0						TKOF RHP	
==> FLIGHT	607	3		3.54	0.00			CH472710	

+++ GENERATE "NOISEMAP3.4" CARD(S)

RUNWAY HEADING IS 27.
RUNWAY NUMBER IS 10.
PATTERN DEFINITION TABLE NUMBER IS 2.
NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS 3.540
NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS 0.000
HELICOPTER IS CH47
PATTERN TURNS RIGHT

==> FLIGHT	607	4		3.54	0.00	CH472710

+++ GENERATE "NOISEMAP3.4" CARD(S)

RUNWAY HEADING IS 27.
RUNWAY NUMBER IS 10.
PATTERN DEFINITION TABLE NUMBER IS 1.
NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS 11.800
NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS .003
HELICOPTER IS UH1H
PATTERN TURNS RIGHT

==> FLIGHT	624	1		11.80	.00	UH1H2710

+++ GENERATE "NOISEMAP3.4" CARD(S)

RUNWAY HEADING IS 27.
RUNWAY NUMBER IS 10.
PATTERN DEFINITION TABLE NUMBER IS 2.
NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS 11.800
NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS .003
HELICOPTER IS UH1H
PATTERN TURNS RIGHT

```
==> FLIGHT     624      2          11.80     .00                             UH1H2710
```

+++ GENERATE "NOISEMAP3.4" CARD(S)

RUNWAY HEADING IS 9.
RUNWAY NUMBER IS 3.
PATTERN DEFINITION TABLE NUMBER IS 1.
NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS 17.700
NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS .007
HELICOPTER IS UH1H
PATTERN TURNS RIGHT

```
==> RUNWAY   43120   48950   57120   48950    7000    7000    5.00         09

==> FLTTRK    4600       0    1800      90    5000       0    1800      90TKOF RHP 1
              9200       0    1800      90    5000       0    1800      90TKOF RHP 2
              4600       0                                                TKOF RHP

==> FLIGHT     624       1           17.70     .01                        UH1H 9 3
```

+++ GENERATE "NOISEMAP3.4" CARD(S)

```
                    RUNWAY HEADING IS  9.
                    RUNWAY NUMBER IS  3.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   17.700
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .007
                    HELICOPTER IS UH1H
                    PATTERN TURNS RIGHT

==> FLIGHT     624       2             17.70     .01                        UH1H 9 3


     +++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS  9.
                    RUNWAY NUMBER IS  3.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    5.310
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                    HELICOPTER IS CH47
                    PATTERN TURNS RIGHT

==> FLIGHT     607       3              5.31    0.00                        CH47 9 3


     +++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS  9.
                    RUNWAY NUMBER IS  3.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    5.310
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                    HELICOPTER IS CH47
                    PATTERN TURNS RIGHT

==> FLIGHT     607       4              5.31    0.00                        CH47 9 3


     +++  GENERATE "NOISEMAP3.4" CARD(S)
```

```
                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 12.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    3.540
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                   HELICOPTER IS CH47
                    PATTERN TURNS LEFT

==> RUNWAY    57120   48950   43120   48950    7000    7000    5.00         27

==> FLTTRK     4600       0    1800     -90    5000       0    1800     -90TKOF LHP 1
               9200       0    1800     -90    5000       0    1800     -90TKOF LHP 2
               4600       0                                                TKOF LHP

==> FLIGHT      607       3            3.54    0.00                        CH472712


     +++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 12.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    3.540
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                    HELICOPTER IS CH47
                    PATTERN TURNS LEFT

==> FLIGHT      607       4            3.54    0.00                        CH472712


     +++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 12.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   11.800
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .003
                    HELICOPTER IS UH1H
                    PATTERN TURNS LEFT

==> FLIGHT      624       1           11.80     .00                        UH1H2712


     +++  GENERATE "NOISEMAP3.4" CARD(S)
```

```
                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 12.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   11.800
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .003
                    HELICOPTER IS UH1H
                    PATTERN TURNS LEFT

==> FLIGHT     624       2          11.80     .00                      UH1H2712


     +++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS  9.
                    RUNWAY NUMBER IS  2.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    8.850
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .004
                    HELICOPTER IS UH1H
                    PATTERN TURNS LEFT

==> RUNWAY   43120   50020   57120   50020    7000    7000    5.00         09

==> FLTTRK    4600       0    1800     -90    5000       0    1800     -90TKOF LHP 1
              9200       0    1800     -90    5000       0    1800     -90TKOF LHP 2
              4600       0                                                TKOF LHP

==> FLIGHT     624       1           8.85     .00                      UH1H 9 2


     +++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS  9.
                    RUNWAY NUMBER IS  2.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    8.850
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .004
                    HELICOPTER IS UH1H
                    PATTERN TURNS LEFT

==> FLIGHT     624       2           8.85     .00                      UH1H 9 2
```

+++ GENERATE "NOISEMAP3.4" CARD(S)

RUNWAY HEADING IS 9.
RUNWAY NUMBER IS 2.
PATTERN DEFINITION TABLE NUMBER IS 1.
NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS 2.665
NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS 0.000
HELICOPTER IS CH47
PATTERN TURNS LEFT

```
==> FLIGHT     607      3          2.67    0.00                    CH47 9 2
```

+++ GENERATE "NOISEMAP3.4" CARD(S)

RUNWAY HEADING IS 9.
RUNWAY NUMBER IS 2.
PATTERN DEFINITION TABLE NUMBER IS 2.
NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS 2.665
NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS 0.000
HELICOPTER IS CH47
PATTERN TURNS LEFT

```
==> FLIGHT     607      4          2.67    0.00                    CH47 9 2
```

+++ GENERATE "NOISEMAP3.4" CARD(S)

RUNWAY HEADING IS 9.
RUNWAY NUMBER IS 2.
PATTERN DEFINTION TABLE NUMBER IS 1.
NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS 2.665
NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS 0.00
HELICOPTER IS CH47
PATTERN TURNS RIGHT

```
==> FLTTRK    4600      0   1800     90   5000      0   1800     90TKOF RHP 1
              9200      0   1800     90   5000      0   1800     90TKOF RHP 2
              4600      0                                          TKOF RHP

==> FLIGHT     607      3          2.67    0.00                    CH47 9 2
```

```
+++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS  9.
                    RUNWAY NUMBER IS  2.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    2.665
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                    HELICOPTER IS CH47
                    PATTERN TURNS RIGHT

==> FLIGHT     607       4          2.67    0.00                 CH47 9 2


+++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS  9.
                    RUNWAY NUMBER IS  2.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    8.850
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .004
                    HELICOPTER IS UH1H
                    PATTERN TURNS RIGHT

==> FLIGHT     624       1          8.85     .00                 UH1H 9 2


+++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS  9.
                    RUNWAY NUMBER IS  2.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    8.850
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .004
                    HELICOPTER IS UH1H
                    PATTERN TURNS RIGHT

==> FLIGHT     624       2          8.85     .00                 UH1H 9 2


+++  GENERATE "NOISEMAP3.4" CARD(S)
```

```
                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    5.900
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .002
                    HELICOPTER IS UH1H
                    PATTERN TURNS RIGHT

==> RUNWAY    57120   50020   43120   50020    7000    7000    5.00          27

==> FLTTRK     4600       0    1800      90    5000       0    1800     90TKOF RHP 1
               9200       0    1800      90    5000       0    1800     90TKOF RHP 2
               4600       0                                               TKOF RHP

==> FLIGHT      624       1              5.90     .00                     UH1H2711


     +++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    5.900
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .002
                    HELICOPTER IS UH1H
                    PATTERN TURNS RIGHT

==> FLIGHT      624       2              5.90     .00                     UH1H2711


     +++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    1.770
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                    HELICOPTER IS CH47
                    PATTERN TURNS RIGHT

==> FLIGHT      607       3              1.77    0.00                     CH472711
```

```
+++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    1.770
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                    HELICOPTER IS CH47
                    PATTERN TURNS RIGHT

==> FLIGHT     607       4           1.77     0.00                         CH472711

+++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    1.770
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                    HELICOPTER IS CH47
                    PATTERN TURNS LEFT

==> FLTTRK    4600       0    1800     -90    5000      0    1800     -90TKOF LHP 1
              9200       0    1800     -90    5000      0    1800     -90TKOF LHP 2
              4600       0                                               TKOF LHP

==> FLIGHT     607       3           1.77     0.00                         CH472711


+++  GENERATE "NOISEMAP3.4" CARD(S)


                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    1.770
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS   0.000
                    HELICOPTER IS CH47
                    PATTERN TURNS LEFT

==> FLIGHT     607       4           1.77     0.00                         CH472711


+++  GENERATE "NOISEMAP3.4" CARD(S)
```

```
                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    5.900
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .002
                    HELICOPTER IS UH1H
                    PATTERN TURNS LEFT

==> FLIGHT     624       1            5.90     .00                    UH1H2711
```

```
    +++  GENERATE "NOISEMAP3.4" CARD(S)
```

```
                    RUNWAY HEADING IS 27.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    5.900
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .002
                    HELICOPTER IS UH1H
                    PATTERN TURNS LEFT

==> FLIGHT     624       2            5.90     .00                    UH1H2711
*** DMPGRD15.                                                          PRNT
*** END
```

```
    **********************     END OF DRIVER PROGRAM     **********************
```

DRIVER also produced the following NOISEMAP3.4 input file:

```
AIRFLD0.0     0.0     0.0     8.      1000.                          EAST
      EXAMPLE 1

PROCES

SEL   6241.   1.      93.7    92.5    91.0    89.6    88.1    86.7    UH1H TO  1
      84.9    83.5    82.0    80.2    79.3    76.1    73.7    70.5    UH1H TO  2
      67.6    64.5    61.0    58.0    54.8    51.1    47.3    43.2    UH1H TO  3
      6241.   2.      98.7    97.5    96.0    94.6    93.2    91.9    UH1H TO  4
```

```
        90.3    89.0    87.7    86.4    85.0    83.6    82.3    80.6    UH1H TO  5
        79.0    77.1    75.1    73.3    71.1    68.5    66.1    63.4    UH1H TO
COMMENT 6242 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6242 - HELICOPTER UH-1H
SEL     6242.   1.      98.7    97.5    96.0    94.6    93.1    91.7    UH1H FO  1
        89.9    88.4    86.6    84.3    81.7    78.8    75.4    70.8    UH1H FO  2
        67.6    64.5    61.0    58.0    54.8    51.1    47.3    43.2    UH1H FO  3
        6242.   2.      103.7   102.5   101.0   99.6    98.2    96.9    UH1H FO  4
        95.3    93.9    92.3    90.5    88.4    86.3    84.0    80.9    UH1H FO  5
        79.0    77.1    75.1    73.3    71.1    68.5    66.1    63.4    UH1H FO
COMMENT 6245 - APPROACH - UH-1H
SEL     6245.   1.      99.9    98.7     97.1   95.6    94.0    92.4    UH1HLAND 1
        90.6    88.9    87.3    85.4    83.4    81.1    78.5    75.2    UH1HLAND 2
        72.1    68.8    65.2    62.1    58.8    55.0    51.2    46.9    UH1HLAND 3
        6245.   2.      104.9   103.7   102.1   100.6   99.1    97.6    UH1HLAND 4
        96.0    94.4    93.0    91.6    90.1    88.6    87.1    85.3    UH1HLAND 5
        83.5    81.4    79.3    77.4    75.1    72.4    70.0    67.1    UH1HLAND
COMMENT 6246 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6246 - HELICOPTER - UH-1H
SEL     6246.   1.      104.9   103.7   102.1   100.6   99.0    97.4    UH1HLAND 1
        95.6    93.8    91.9    89.5    86.8    83.8    80.2    75.5    UH1HLAND 2
        72.1    68.8    65.2    62.1    58.8    55.0    51.2    46.9    UH1HLAND 3
        6246.   2.      109.9   108.7   107.1   105.6   104.1   102.6   UH1HLAND 4
        101.0   99.3    97.6    95.7    93.5    91.3    88.8    85.6    UH1HLAND 5
        83.5    81.4    79.3    77.4    75.1    72.4    70.0    67.1    UH1HLAND
COMMENT 624009 HOVER-IN-GROUND EFFECT
COMMENT 624009 HELICOPTER - UH-1H
AL        624009         091.0  88.9    86.9    84.8    82.6    80.4    UH1H   IN 1
        78.2    75.8    73.4    70.8    68.1    65.1    61.8    58.1    UH1H   IN 2
        53.9    49.5    45.8    41.8    37.4    32.7    27.5    22.1    UH1H   IN 3
          624009        3089.8  87.7    85.7    83.6    81.4    79.2    UH1H   IN 4
        77.0    74.6    72.2    69.6    66.9    63.9    60.6    56.9    UH1H   IN 5
        52.7    48.3    44.6    40.6    36.2    31.5    26.3    20.9    UH1H   IN 6
          624009        6091.3  89.2    87.2    85.1    82.9    80.7    UH1H   IN 7
        78.5    76.1    73.7    71.1    68.4    65.4    62.1    58.4    UH1H   IN 8
        54.2    49.8    46.1    42.1    37.7    33.0    27.8    22.4    UH1H   IN 9
          624009        9090.7  88.6    86.6    84.5    82.3    80.1    UH1H   IN10
        77.9    75.5    73.1    70.5    67.8    64.9    61.5    57.8    UH1H   IN11
        53.6    49.2    45.5    41.5    37.1    32.4    27.2    21.8    UH1H   IN12
          624009       12093.0  90.9    88.9    86.8    84.6    82.4    UH1H   IN13
        80.2    77.8    75.4    72.8    70.1    67.2    63.8    60.1    UH1H   IN14
        55.9    51.5    47.8    43.8    37.4    34.7    29.5    23.1    UH1H   IN15
          624009       15096.8  94.7    92.7    90.6    88.4    86.2    UH1H   IN16
        84.0    81.6    79.2    76.6    73.9    71.0    67.6    63.9    UH1H   IN17
        59.7    55.3    51.6    47.6    43.2    38.5    33.3    27.9    UH1H   IN18
          624009       18096.5  94.4    92.4    90.3    88.1    85.9    UH1H   IN19
        83.7    81.3    79.0    76.3    73.6    70.7    67.3    63.6    UH1H   IN20
        59.4    55.0    51.3    47.3    42.9    38.2    33.0    27.6    UH1H   IN
COMMENT 624008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 624008 HELICOPTER - UH-1H
AL        624008         091.5  89.4    87.3    85.2    83.0    80.8    UH1H OUT 1
        78.5    76.1    73.6    71.1    68.4    65.5    62.3    58.7    UH1H OUT 2
        54.6    50.3    46.4    42.2    37.6    32.6    27.2    21.5    UH1H OUT 3
          624008        3090.8  88.7    86.6    84.5    82.3    80.1    UH1H OUT 4
```

```
      77.8    75.4    72.9    70.4    67.7    64.8    61.6    58.0    UH1H OUT 5
      53.9    49.6    45.7    41.5    36.9    31.9    26.5    20.8    UH1H OUT 6
        624008      6093.1    91.0    88.9    86.8    84.6    82.4    UH1H OUT 7
      80.1    77.7    75.2    72.7    70.0    67.1    63.9    60.3    UH1H OUT 8
      56.2    51.9    48.0    43.8    39.2    34.2    28.8    23.1    UH1H OUT 9
        624008      9093.5    91.4    89.3    87.2    85.0    82.8    UH1H OUT10
      80.5    78.1    75.6    73.1    70.4    67.5    64.3    60.7    UH1H OUT11
      56.6    52.3    48.4    44.2    39.6    34.6    29.2    23.5    UH1H OUT12
        624008     12097.1    95.0    92.9    90.8    88.6    86.4    UH1H OUT13
      84.1    81.7    79.2    76.7    74.0    71.1    67.9    64.3    UH1H OUT14
      60.2    55.9    52.0    47.8    43.2    38.2    32.8    22.1    UH1H OUT15
        624008     150101.2   99.1    97.0    94.9    92.7    90.5    UH1H OUT16
      88.2    85.8    83.3    80.8    78.1    75.2    72.0    68.4    UH1H OUT17
      64.3    60.0    56.1    51.9    47.3    42.3    36.9    31.2    UH1H OUT18
        624008     18099.1    97.0    94.9    92.8    90.6    88.4    UH1H OUT19
      86.1    83.7    81.2    78.7    76.0    73.1    69.9    66.3    UH1H OUT20
      62.2    57.9    54.0    49.8    45.2    40.2    34.8    29.1    UH1H OUT
COMMENT 6071 - TAKEOFF,FLYOVER - CH-47
SEL   6071.   1.      96.1    94.6    93.3    91.9    90.5    88.9    CH47 TO  1
      87.3    85.8    84.2    82.3    80.4    78.2    75.8    73.1    CH47 TO  2
      70.1    67.0    63.5    60.3    56.6    52.5    48.6    44.7    CH47 TO  3
      6071.   2.      101.1   99.6    98.3    96.9    95.7    94.2    CH47 TO  4
      92.9    91.7    90.5    89.2    87.9    86.6    85.2    83.7    CH47 TO  5
      82.3    80.5    78.8    77.1    75.1    72.7    70.4    67.8    CH47 TO
COMMENT 6072 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6072 - HELICOPTER CH-47
SEL   6072.   1.      101.1   99.6    98.3    96.9    95.5    93.9    CH47 FO  1
      92.3    90.7    88.8    86.4    83.8    80.9    77.5    73.4    CH47 FO  2
      70.1    67.0    63.5    60.3    56.6    52.5    48.6    44.7    CH47 FO  3
      6072.   2.      106.1   104.6   103.3   101.9   100.7   99.2    CH47 FO  4
      97.9    96.6    95.1    93.3    91.3    89.3    86.9    84.0    CH47 FO  5
      82.3    80.5    78.8    77.1    75.1    72.7    70.4    67.8    CH47 FO
COMMENT 6075 - APPROACH - CH-47
SEL   6075.   1.      102.3   100.8   99.4    97.9    96.4    94.6    CH47LAND 1
      92.8    91.2    89.5    87.5    85.5    83.2    80.6    77.8    CH47LAND 2
      74.6    71.3    67.7    64.4    60.6    56.4    52.5    48.4    CH47LAND 3
      6075.   2.      107.3   105.8   104.4   102.9   101.6   99.9    CH47LAND 4
      98.4    97.1    95.8    94.4    93.0    91.6    90.0    88.4    CH47LAND 5
      86.8    84.8    83.0    81.2    79.1    76.6    74.3    71.5    CH47LAND
COMMENT 6076 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6076 - HELICOPTER - CH-47
SEL   6076.   1.      107.3   105.8   104.4   102.9   101.4   99.6    CH47LAND 1
      97.8    96.1    94.1    91.6    88.9    85.9    82.3    78.1    CH47LAND 2
      74.6    71.3    67.7    64.4    60.6    56.4    52.5    48.4    CH47LAND 3
      6076.   2.      112.3   110.8   109.4   107.9   106.6   104.9   CH47LAND 4
      103.4   102.0   100.4   98.5    96.4    94.3    91.7    88.7    CH47LAND 5
      86.8    84.8    83.0    81.2    79.1    76.6    74.3    71.5    CH47LAND
COMMENT 607009 HOVER-IN-GROUND EFFECT
COMMENT 607009 HELICOPTER - CH-47
AL      607009        0100.9  98.9    96.8    94.7    92.5    90.2    CH47   IN 1
      87.9    85.5    82.9    80.2    77.4    74.3    70.9    67.1    CH47   IN 2
      62.9    58.5    54.7    50.7    46.4    41.7    36.7    31.5    CH47   IN 3
        607009       30100.6  98.6    96.5    94.4    92.2    89.9    CH47   IN 4
      87.6    85.2    82.6    79.9    77.1    74.0    70.6    66.8    CH47   IN 5
```

```
        62.6     58.2     54.4     50.4     46.1     41.4     36.4     31.2     CH47   IN 6
          607009       60100.6     98.6     96.5     94.4     92.2     89.9     CH47   IN 7
        87.6     85.2     83.6     79.9     77.1     74.0     70.6     66.8     CH47   IN 8
        62.6     58.2     54.4     50.4     46.1     41.4     36.4     31.2     CH47   IN 9
          607009        9098.1     96.1     94.0     91.9     89.7     87.4     CH47   IN10
        85.1     82.7     80.1     77.4     74.6     71.5     68.1     64.3     CH47   IN11
        60.1     55.7     51.9     47.9     43.6     38.9     33.9     28.7     CH47   IN12
          607009      12098.9      96.9     94.8     92.7     90.5     88.2     CH47   IN13
        85.9     83.5     80.9     78.2     75.4     72.3     68.9     65.1     CH47   IN14
        60.9     56.5     52.7     48.7     44.4     39.7     34.7     29.5     CH47   IN15
          607009      15097.9      95.9     93.8     91.7     89.5     87.2     CH47   IN16
        84.9     82.5     79.9     77.2     73.4     70.3     67.9     64.1     CH47   IN17
        59.9     55.5     51.7     47.7     43.4     38.7     33.7     28.5     CH47   IN18
          607009      18094.2      92.2     90.1     88.0     85.8     83.5     CH47   IN19
        81.3     78.8     76.2     73.5     70.7     67.6     64.2     60.4     CH47   IN20
        56.2     51.8     48.0     44.0     39.7     35.0     30.0     24.8     CH47   IN
COMMENT 607008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 607008 HELICOPTER - CH-47
AL        607008         099.4     97.3     95.2     93.1     91.0     88.7     CH47 OUT 1
        86.4     84.1     81.6     79.0     76.3     73.3     70.1     66.4     CH47 OUT 2
        62.3     57.9     54.2     50.1     44.7     40.8     35.6     30.0     CH47 OUT 3
          607008       30100.6     98.5     96.4     94.3     92.2     89.9     CH47 OUT 4
        87.6     85.3     82.8     80.2     77.5     74.5     71.3     67.6     CH47 OUT 5
        63.5     59.1     55.4     51.3     45.9     42.0     36.8     31.2     CH47 OUT 6
          607008       60103.1     101.0    98.9     96.8     94.7     92.4     CH47 OUT 7
        90.1     87.8     85.3     82.7     80.0     77.0     73.8     70.1     CH47 OUT 8
        66.0     61.6     57.9     53.8     48.4     44.5     39.3     33.7     CH47 OUT 9
          607008       90101.      99.7     97.6     95.5     93.4     91.1     CH47 OUT10
        88.8     86.5     84.0     81.4     78.7     75.7     72.5     68.8     CH47 OUT11
        64.7     60.3     56.6     52.5     47.1     43.2     38.0     32.4     CH47 OUT12
          607008      120101.0     98.9     95.8     94.7     92.6     90.3     CH47 OUT13
        88.0     85.7     83.2     80.6     77.9     74.9     71.7     68.0     CH47 OUT14
        63.9     59.5     55.8     51.7     46.3     42.4     37.2     31.6     CH47 OUT15
          607008      15098.7      96.6     94.5     92.4     90.3     88.0     CH47 OUT16
        85.7     83.4     80.9     78.3     75.6     72.6     69.4     65.7     CH47 OUT17
        61.6     57.2     53.5     49.4     44.0     40.1     34.9     29.3     CH47 OUT18
          607008      180101.3     99.2     97.1     95.0     92.9     90.6     CH47 OUT19
        88.3     86.0     83.5     80.9     78.2     75.2     72.0     68.3     CH47 OUT20
        64.2     59.8     56.1     52.0     46.6     41.7     37.5     31.9     CH47 OUT
TODSCR        624         1         1         1      1800              6242    37422UH1HPTRN *
             6246     39708                                                         UH1HPTRN
ALTUDE          1         0         0         0        72       400      4600      400PTRN 604 *
             7427       425     12427       700     27281       700     32281      400PTRN 604 *
            35108       375     35422       375     39708         0         0        0PTRN 604
DSEL           1.       0.0        0.       0.0   150000.       0.0        0.        0.    PTRN
RUNWAY      43120     51150     57120     51150      7000      7000      5.00           09
FLTTRK       4600         0      1800       -90      5000         0      1800      -90TKOF LHP 1
             9200         0      1800       -90      5000         0      1800      -90TKOF LHP 2
             4600         0                                                         TKOF LHP
FLIGHT        624         1               17.70       .01                           UH1H 9 1
TODSCR        624         2         2         1      1800              6242    38080UH1HPTRN *
             6246     39708                                                         UH1HPTRN
ALTUDE          2         0         0         0        72       400      4600      400PTRN 604 *
             7427       425     12427       700     27281       700     32281      400PTRN 604 *
```

	35108	375	36654	375	39708	0	0	0PTRN 604
FLIGHT	624	2		17.70	.01			UH1H 9 1
TODSCR	607	3	1	1	1800		6072	37422CH47PTRN *
	6076	39708						CH47PTRN
FLIGHT	607	3		5.31	0.00			CH47 9 1
TODSCR	607	4	2	1	1800		6072	38080CH47PTRN *
	6076	39708						CH47PTRN
FLIGHT	607	4		5.31	0.00			CH47 9 1
RUNWAY	57120	51150	43120	51150	7000	7000	5.00	27
FLTTRK	4600	0	1800	90	5000	0	1800	90TKOF RHP 1
	9200	0	1800	90	5000	0	1800	90TKOF RHP 2
	4600	0						TKOF RHP
FLIGHT	607	3		3.54	0.00			CH472710
FLIGHT	607	4		3.54	0.00			CH472710
FLIGHT	624	1		11.80	.00			UH1H2710
FLIGHT	624	2		11.80	.00			UH1H2710
RUNWAY	43120	48950	57120	48950	7000	7000	5.00	09
FLTTRK	4600	0	1800	90	5000	0	1800	90TKOF RHP 1
	9200	0	1800	90	5000	0	1800	90TKOF RHP 2
	4600	0						TKOF RHP
FLIGHT	624	1		17.70	.01			UH1H 9 3
FLIGHT	624	2		17.70	.01			UH1H 9 3
FLIGHT	607	3		5.31	0.00			CH47 9 3
FLIGHT	607	4		5.31	0.00			CH47 9 3
RUNWAY	57120	48950	43120	48950	7000	7000	5.00	27
FLTTRK	4600	0	1800	-90	5000	0	1800	-90TKOF LHP 1
	9200	0	1800	-90	5000	0	1800	-90TKOF LHP 2
	4600	0						TKOF LHP
FLIGHT	607	3		3.54	0.00			CH472712
FLIGHT	607	4		3.54	0.00			CH472712
FLIGHT	624	1		11.80	.00			UH1H2712
FLIGHT	624	2		11.80	.00			UH1H2712
RUNWAY	43120	50020	57120	50020	7000	7000	5.00	09
FLTTRK	4600	0	1800	-90	5000	0	1800	-90TKOF LHP 1
	9200	0	1800	-90	5000	0	1800	-90TKOF LHP 2
	4600	0						TKOF LHP
FLIGHT	624	1		8.85	.00			UH1H 9 2
FLIGHT	624	2		8.85	.00			UH1H 9 2
FLIGHT	607	3		2.67	0.00			CH47 9 2
FLIGHT	607	4		2.67	0.00			CH47 9 2
FLTTRK	4600	0	1800	90	5000	0	1800	90TKOF RHP 1
	9200	0	1800	90	5000	0	1800	90TKOF RHP 2
	4600	0						TKOF RHP
FLIGHT	607	3		2.67	0.00			CH47 9 2
FLIGHT	607	4		2.67	0.00			CH47 9 2
FLIGHT	624	1		8.85	.00			UH1H 9 2
FLIGHT	624	2		8.85	.00			UH1H 9 2
RUNWAY	57120	50020	43120	50020	7000	7000	5.00	27
FLTTRK	4600	0	1800	90	5000	0	1800	90TKOF RHP 1
	9200	0	1800	90	5000	0	1800	90TKOF RHP 2
	4600	0						TKOF RHP
FLIGHT	624	1		5.90	.00			UH1H2711
FLIGHT	624	2		5.90	.00			UH1H2711
FLIGHT	607	3		1.77	0.00			CH472711

```
FLIGHT     607     4             1.77    0.00                     CH472711
FLTTRK    4600     0     1800     -90    5000     0    1800    -90TKOF LHP 1
          9200     0     1800     -90    5000     0    1800    -90TKOF LHP 2
          4600     0                                              TKOF LHP
FLIGHT     607     3             1.77    0.00                     CH472711
FLIGHT     607     4             1.77    0.00                     CH472711
FLIGHT     624     1             5.90     .00                     UH1H2711
FLIGHT     624     2             5.90     .00                     UH1H2711
DMPGRD15.                                                          PRNT
END
```

Example 2

This section shows a sample run of the DRIVER program. This example does not include collecting the data, but it does show the user how to proceed after receiving the data (shown in Figure 6). This is a more complicated example than Example 1.

Example 2:

1. Gets a plot as NOISEMAP3.4 output
2. Shows a form for figuring the number of iterations from information on percentages
3. Mixes English and metric units
4. Has a nonsymmetric pattern
5. Starts to descend before the final segment
6. Includes the turns when measuring the segments
7. Has three different angles of descent

Example 2 uses the following instructions:

```
From DRIVER                          From NOISEMAP3.4
 $RUNWY                                 ALIGN
 $TABLE                                 UNITS
 $ACTON                                 AIRFLD
                                        SEL, AL
                                        PLOT
                                        END
```

The first step is to form a general idea of what output from NOISEMAP3.4 is needed. Some of the common outputs are:

1. a plot (NOISEMAP3.4 PLOT instruction)
2. a posting of noise levels at regularly spaced points (NOISEMAP3.4 DMPGRD instruction)
3. a rough plot (on a line printer) (NOISEMAP3.4 PRPLOT instruction)

The NOISEMAP3.4 PLOT instruction produces a plot of equal dB contours--that is, it connects points at the same noise level. The PLOT instruction

Date Field height MSL	Field	DAY	NIGHT
Runway 6	% utilization	40	45
Runway 24	% utilization	60	55

		DAY	NIGHT
GENERAL INFORMATION	Aircraft Type	OH58	OH58
	No. of Aircraft Period	10	1
	Number of Periods	2	1
	% Utilization		
	Annual Corridor Ops.		
	Basefield		
	Corridor Route		

		DAY	NIGHT
STAGEFIELD OPERATIONS	Annual Field Ops.	416	16
	Annual Field Pattern Iterations	208	8
	Iterations per Runway	104	4

Pattern Segments:

(speed in knots, height/length in feet)

Leg	Length	Starting Speed	End Speed	Start Height (AFL)	End Height (AFL)
Takeoff	5200	0	75	0	450
Crosswind	5000	75	100	450	700
Downwind	9200	100	100	700	700
Base	5000	100	80	700	450
Final	4000	80	0	450	0

Takeoff climb rate (ft/min) 500

Speed upon reaching pattern height 100

Radius of turn or bank angle 1500

Landing descent glide slope 6°-10%, 9°-70%, 15°-20%

Speed at start of descent 80

NOTES: Length of segments include the turn. The flight pattern is not symmetrical! It is longer to the northeast, no matter from which direction the helicopter takes off.

Figure 6. Data sheet for Example 2.

actually produces a file of GPCP input (General Purpose Contouring Package--a program for plotting contours) for the plot. The plot has to be drawn separately by whatever plotting facilities are available

The NOISEMAP3.4 DMPGRD instruction superimposes a grid over the area and prints the noise level at each point of the grid. It is printed on a regular printer, but it is to scale.

The NOISEMAP3.4 PRPLOT instruction produces rough contours on a regular printer. Points at the same noise level have the same letter printed on them. The letters form rough contours, and the result is to scale.

This example asks for a plot of contours at 62, 66, 70, and 74 dB.

The first cards in the DRIVER input file should be the first cards in the NOISEMAP3.4 input file. These cards include an AIRFLD instruction, a PROCES instruction, and any other initializing instructions that the user picks (such as ALIGN, LIMITS, ECHO, NODATA, and NEF--see the NOISEMAP3.4 user's manual[3] for more details). Since these NOISEMAP3.4 instructions do not contain DRIVER keywords, they are copied into the output files unchanged.

This example uses the ALIGN, AIRFLD, PROCES, and LIMITS instructions from NOISEMAP3.4. (The ALIGN instruction merely limits the number of "title" pages in the NOISEMAP3.4 output. The PROCES instruction tells NOISEMAP3.4 to actually process the data, instead of just checking it for errors. The LIMITS instruction tells NOISEMAP3.4 to look at a smaller area than it would otherwise. LIMITS is explained more fully below.) The map (see Figure 7) is in metric units. But NOISEMAP3.4 and DRIVER assume English units. To use the measurements from the map, the user can either put in UNITS instructions, which tell whether the units of the input are English or metric, or convert all metric to English. (This example uses UNITS instruction.) The initial section should be in metric units, because the AIRFLD and LIMITS instructions define the grid in terms of the metric units of the map, and the PROCES instruction has no numbers.

The area of interest is small. (With a pattern on each side of the runways, it is still only 9200 ft long, and 4000 ft (from runways) + 5000 ft + 5000 ft (from two patterns) wide (i.e., it is 9200 ft x 14,000 ft or about 3000 x 5000 m). So put the grid lines 500 ft (152.4 m) apart (half the standard spacing) in the 100 x 100 grid. Thus, it is 15 240 m across, or 7620 m from the center to the edge.

The runways should be centered on the grid. In order to do this, it is necessary to compute the center of the area covered by the runways. The center of the runways is the average of the extremes of all the runways. From the map (Figure 7), the left-most coordinate of a runway is 1000 and the right-most coordinate is 1346.4. So the x coordinate of the center is:

$$(1000.0 + 1346.4)/2 = 1173.2$$

[3]AMRL-TR-78-109.

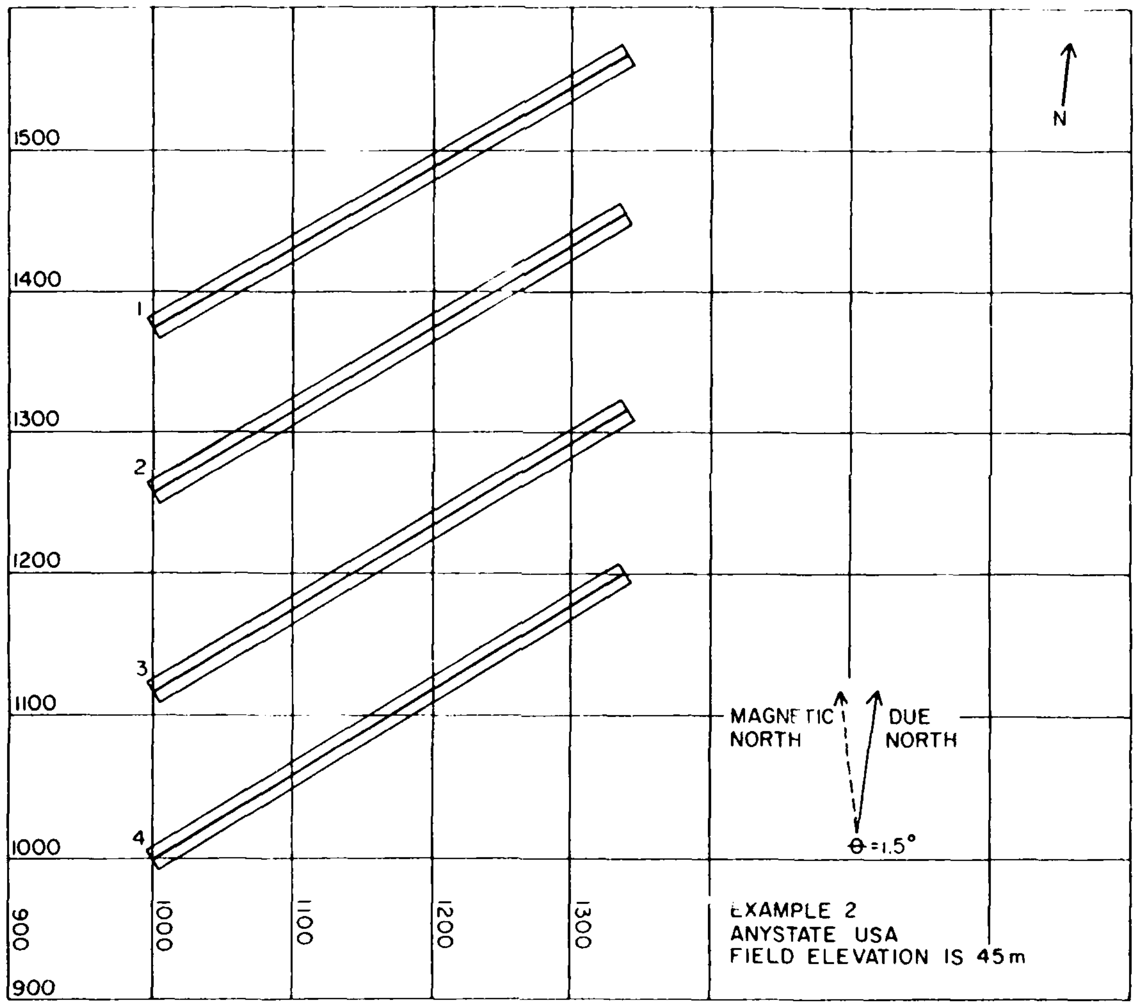

Figure 7. Map for Example 2.

Also from the map, the highest coordinate of a runway is 1575.3 and the lowest coordinate of a runway is 1000. So the y coordinate of the center is:

$$(1000.0 + 1575.3)/2 = 1287.65$$

Thus, the middle of the runways is (1173.2, 1287.65). This should be the center of the grid. Thus, the lower left-hand corner of the grid is:

$$(1173.2 - 7620.0,\ 1287.65 - 7620.0) = (-6446.8,\ -6332.35)$$

The other information needed by the AIRFLD instruction, the magnetic declination and field elevation, can be found on the map. In this case, the magnetic declination is 1.5 degrees to the west. The field elevation is 45 m above sea level.

Running NOISEMAP3.4 is much less expensive if computations are not performed at every point. The LIMITS instruction allows the user to specify a smaller area of interest where noise levels should be computed. A convenient size for the smaller grid is one-fourth of the size of the original grid--half the size in each direction. Since the distance from the center to the edge is 7620 m, it is 3810 m from the center to halfway to the edge. The center of the grid is (1173.2, 1287.65), as computed above. The x coordinates of the smaller grid are from 1173.2 - 3810.0 to 1173.2 + 3810.0, or from -2636.8 to 4983.2. The y coordinates are from 1287.65 - 3810.0 to 1287.65 + 3810.0, or from -2522.35 to 5097.65. Thus the LIMITS instruction is:

```
LIMITS-2636.8 4983.2  -2522.355097.65
      7        5        3        1
               1        2        3
```

The initial DRIVER input segment of NOISEMAP3.4 instructions is as follows:

```
ALIGN 1.0
UNITS                                                        METRIC
AIRFLD-6446.8 -6332.351.5     45.      152.4                 WEST
      EXAMPLE 2
PROCES
LIMITS-2636.8 4983.2  -2522.355097.65
UNITS                                                        ENGLISH
```

SEL and AL profiles of the helicopters used are next in the NOISEMAP3.4 input. A user unfamiliar with these profiles should contact CERL-EN, Acoustics, or the helicopters' manufacturer(s) to obtain these profiles. Some of these profiles are listed in the Appendix. The SEL (Sound Exposure Level) and AL (A-weighted noise level) cards describe the noise level from the aircraft at various distances for flight (SEL) and run-up (AL). They vary between aircraft, but are standard for each aircraft and so do not change. Since these profiles are constant and fairly large, they are usually stored

separately on the computer and put into the NOISEMAP3.4 input later. These profiles can be put into the DRIVER output of NOISEMAP3.4 cards either with an editor or with file manipulation in the JCL.

The next section of input is actual DRIVER input. To make checking easier, runway and pattern definition information should be entered first. There is a problem, however, because the map (runway information) is metric and the data sheets (pattern definition information) and the DRIVER program are English. When DRIVER processes the runway information, it does not implicitly assume English units--just consistent units. The runway data is used on only one NOISEMAP3.4 instruction--the RUNWAY card. Because of the preceding reasons, the runway information can be entered in metric. UNITS instructions should be used to tell NOISEMAP3.4 which units are currently being used, i.e., UNITS instructions to change to metrics, then RUNWAY instructions, then UNITS instructions to change back to English). On the other hand, DRIVER implicitly assumes that the data on the $TABLE instructions (flight description) are in English units. Thus, the flight descriptions must be in English units. For the runway library ($RUNWAY instruction), the following information is needed:

1. The heading of the runway

2. A unique runway number (to differentiate parallel runways)

3. The coordinates of the ends of the runway

4. The takeoff and landing threshold displacements.

The runways are all parallel with a heading of 6, as read from the data sheet (Figure 6). Note that on the map the runways are numbered from 1 to 4, starting with the northern-most runway. The number of the reciprocal runway (the same physical runway, but the opposite direction) is nine more than the number of the original runway. Thus, the northern-most runway is runway 1 from west to east, and is runway 10 from east to west. Likewise for the other runways, the coordinates of the ends of the runways can be read from the map:

runway 1/10	(1000.0, 1375.3) and (1346.4, 1575.3)
runway 2/11	(1000.0, 1259.8) and (1346.4, 1459.8)
runway 3/12	(1000.0, 1115.5) and ,1346.4, 1315.5)
runway 4/13	(1000.0, 1000.0) and (1346.4, 1200.0).

This example assumes that the helicopters land on and takeoff from the same place in the middle of the runway. Thus the default displacements of the middle of the runway are right. The default displacement values are correct for both directions. Therefore, each physical runway has to be entered only once. (The reciprocal runways are entered automatically with the default displacements.) Since there are four runways, the folowing four $RUNWY instructions are needed:

RUNWAY HEADING	RUNWAY NUMBER	X START	Y START	X END	Y END
$RUNWY6	1	1000.	1375.3	1346.4	1575.3
$RUNWY6	2	1000.	1259.8	1346.4	1459.8
$RUNWY6	3	1000.	1115.5	1346.4	1315.5
$RUNWY6	4	1000.	1000.	1346.4	1200.
7	5	3	1	9	7
	1	2	3	3	4

The pattern definition information is entered next with $TABLE instructions. The $TABLE instruction needs the following information:

1. The length of each segment

2. Whether the segment lengths include the radii of the turns at each end (i.e., whether measurements are made as in Figure 1 or 2)

3. The speed of the helicopter at each end of each segment

4. The distance of the helicopter above ground level (AGL) at each end of each segment

5. The takeoff climb rate

6. The landing descent glide slope

7. The speed at the end of ascent and at the beginning of descent

8. The turn radius, or the turn rate, or the bank angle (see Figures 1 and 2).

All of this information can be read from the data sheet. Notice the note on the data sheet which says the flight patterns are not symmetric: They are longer to the northeast. For runways 1, 2, 3, and 4, northeast is the upwind segment, so the upwind segment is longer than the final segment. For runways 10, 11, 12, and 13, northeast is the final segment, so the final segment is longer than the upwind segment. Since the flight pattern is not symmetrical, twice as many $TABLE instructions are needed--one with the upwind segment longer than the final segment, and the other $TABLE the other way around. The flight paths are very similar, except that there are three different descent glide slopes. So three $TABLEs with different descent glide slopes are needed for each of the "mirror-image" $TABLEs. Thus there are six $TABLEs in all. Since the segments include the turns (see the note on the data sheet), this should be indicated on the first $TABLE card (in each instruction) by putting RADSINCLUD in columns 71 through 80. The six pattern-definition $TABLEs follow:

LENGTH	START SPEED	END SPEED	START HEIGHT	END HEIGHT	ALPHA ID
$TABLE1					RADSINCLUD
5200.	0.	75.	0.	375.	UPW
5000.	75.	100.	375.	650.	CRSW
9200.	100.	100.	650.	650.	DWNW
5000.	100.	80.	650.	375.	BASE
4000.	80.	0.	375.	0.	FINL
500.	100.	6.	80.	1500.	RDUS
$TABLE2					RADSINCLUD
4000.	0.	75.	0.	375.	UPW
5000.	75.	100.	375.	650.	CRSW
9200.	100.	100.	650.	650.	DWNW
5000.	100.	80.	650.	375.	BASE
5200.	80.	0.	375.	0.	FINL
500.	100.	6.	80.	1500.	RDUS
$TABLE3					RADSINCLUD
5200.	0.	75.	0.	375.	UPW
5000.	75.	100.	375.	650.	CRSW
9200.	100.	100.	650.	650.	DWNW
5000.	100.	80.	650.	375.	BASE
4000.	80.	0.	375.	0.	FINL
500.	100.	9.	80.	1500.	RDUS
$TABLE4					RADSINCLUD
4000.	0.	75.	0.	375.	UPW
5000.	75.	100.	375.	650.	CRSW
9200.	100.	100.	650.	650.	DWNW
5000.	100.	80.	650.	375.	BASE
5200.	80.	0.	375.	0.	FINL
500.	100.	9.	80.	1500.	RDUS
$TABLE5					RADSINCLUD
5200.	0.	75.	0.	375.	UPW
5000.	75.	100.	375.	650.	CRSW
9200.	100.	100.	650.	650.	DWNW
5000.	100.	80.	650.	375.	BASE
4000.	80.	0..	375.	0.	FINL
500.	100.	15.	80.	1500.	RDUS
$TABLE6					RADSINCLUD
4000.	0.	75.	0.	375.	UPW
5000.	75.	100.	375.	650.	CRSW
9200.	100.	100.	650.	650.	DWNW
5000.	100.	80.	650.	375.	BASE
5200.	80.	0.	375.	0.	FINL
500.	100.	15.	80.	1500.	RDUS

After entering the runway and pattern-definition information, the user should specify the actual flights. This is done with the DRIVER $ACTON instructions. The $ACTON instruction needs the following information:

1. Runway number and heading

2. Pattern-definition number and whether it is in the table library or the flight library

EXAMPLE 2

DAY

208 ITERATIONS		40 % on 6 - 83.2	
OH58 HELICOPTER		60 % on 24 - 124.8	
4 # of RUNWAYS			
Angle - %	20.8 # on EACH 6	31.2 # on EACH 24	
6	10	2.08	3.12
9	70	14.56	21.84
15	20	4.16	6.24

EXAMPLE 2

NIGHT

8 ITERATIONS		45 % on 6 - 3.6	
OH58 HELICOPTER		55 % on 24 - 4.4	
4 # of RUNWAYS			
Angle - %	.9 # on EACH 6	1.1 # on EACH 24	
6	10	.09	.11
9	70	.63	.77
15	20	.18	.22

Figure 8. Figuring iterations for Example 2.

3. Number of daytime and nighttime pattern iterations per day

4. Which helicopter is used

5. Which way the pattern goes--whether the pilot turns left or right, or equivalently, whether the pattern goes north or south, east or west of the runway.

The data sheet says that the OH58 helicopter is being used. All flight descriptions are in the table library (i.e., they were entered using a $TABLE instruction). Because of the nonsymmetry of the patterns, runways 1, 2, 3, and 4 use the odd-numbered tables, while runways 10, 11, 12, and 13 use the even-numbered tables. This way, when a helicopter takes off from west to east, the longer leg is the takeoff leg, and when a helicopter takes off from east to west, the longer leg is the final leg. In either case, the pattern is longer to the northeast than to the southwest.

Figure 8 shows a worksheet figuring the number of iterations for each runway, in both directions, and each pattern definition for both day and night. The procedure used on the worksheet is as follows: First, read the total pattern iterations from the data sheet (annual field pattern iterations). Multiply this total by the percentage at each heading. Then divide by the number of parallel runways to get the number of iterations on an individual logical runway (i.e., one heading of one runway). The next step is to figure out how many iterations on each logical runway are at each descent glide slope. This is done by multiplying the iterations by the percentage of iterations at each descent glide slope.

Helicopters using runways 1/10 and 2/11 circle north of the runways, while runways 3/12 and 4/13 circle south of the runways to minimize cross-over. To fly north from runways 1 and 2, the pilot turns left. To fly south from runways 3 and 4, the pilot turns right. To fly north from runways 10 and 11, the pilot turns right. The pilot turns left to fly south from runways 12 and 13.

The $ACTON instructions are as follows:

RUNWAY HEADING	RUNWAY NUMBER	PATTERN DEF NUMBER	DAY ITER'S	NIGHT ITER'S	CRAFTDIR ALPHA OF ID PAT
$ACTON6	1	1	2.08	.09	OH58LHP
$ACTON6	1	3	14.56	.63	OH58LHP
$ACTON6	1	5	4.16	.18	OH58LHP
$ACTON6	2	1	2.08	.09	OH58LHP
$ACTON6	2	3	14.56	.63	OH58LHP
$ACTON6	2	5	4.16	.18	OH58LHP
$ACTON6	3	1	2.08	.09	OH58RHP
$ACTON6	3	3	14.56	.63	OH58RHP
$ACTON6	3	5	4.16	.18	OH58RHP
$ACTON6	4	1	2.08	.09	OH58RHP
$ACTON6	4	3	14.56	.63	OH58RHP
$ACTON6	4	5	4.16	.18	OH58RHP

```
$ACTON24      10        2        3.12      .11                              OH58RHP
$ACTON24      10        4        21.84     .77                              OH58RHP
$ACTON24      10        6        6.24      .22                              OH58RHP
$ACTON24      11        2        3.12      .11                              OH58RHP
$ACTON24      11        4        21.84     .77                              OH58RHP
$ACTON24      11        6        6.24      .22                              OH58RHP
$ACTON24      12        2        3.12      .11                              OH58LHP
$ACTON24      12        4        21.84     .77                              OH58LHP
$ACTON24      12        6        6.24      .22                              OH58LHP
$ACTON24      13        2        3.12      .11                              OH58LHP
$ACTON24      13        4        21.84     .77                              OH58LHP
$ACTON24      13        6        6.24      .22                              OH58LHP
```

This ends the DRIVER instructions in the input. The next, and last, part ofthe input file is NOISEMAP3.4 instructions that specify output. This example asks for a plot at 62, 66, 70, and 74 dB. The NOISEMAP3.4 PLOT instruction does not produce the actual plot as output, but rather input for the GPCP (General Purpose Contouring Package) program which will produce the plot. The plot should not mark grid points, but should plot the flighttrack map (option 2). All the GPCP cards should be together, so the option is positive--+2 rather than -2. (See the NOISEMAP3.4 user's manual.)[4] Plot at a scale of 1 in. = 2000 ft, or 1:24,000. Thus, the PLOT instruction is as follows:

```
PLOT  2.      24000.  62.      66.      70.      74.
      7       5       3        1        9        7
              1       2        3        3        4
```

The last card has to be an END instruction. Collecting all the cards together in order shows that the DRIVER input file is as follows:

```
ALIGN 1.0
                                                                  METRIC UNITS
AIRFLD-6446.8 4983.2  -2522.355097.65                                  WEST
     EXAMPLE 2
PROCES
                                                                  ENGLISH UNITS
$RUNWY6       1       1000.    1375.3   1346.4   1575.3
$RUNWY6       2       1000.    1259.8   1346.4   1459.8
$RUNWY6       3       1000.    1115.5   1346.4   1315.5
$RUNWY6       4       1000.    1000.    1346.4   1200.
$TABLE1                                                                RADSINCLUD
     5200.    0.      75.      0.       375.                           UPW
     5000.    75.     100.     375.     650.                           CRSW
     9200.    100.    100.     650.     650.                           DWNW
     5000.    100.    80.      650.     375.                           BASE
     4000.    80.     0.       375.     0.                             FINL
     500.     100.    6.       80.      1500.                          RDUS
$TABLE2                                                                RADSINCLUD
     4000.    0.      75.      0.       375.                           UPW
```

---

[4] AMRL-TR-78-109.

```
        5000.   75.     100.    375.    650.                    CRSW
        9200.   100.    100.    650.    650.                    DWNW
        5000.   100.    80.     650.    375.                    BASE
        5200.   80.     0.      375.    0.                      FINL
        500.    100.    6.      80.     1500.                   RDUS
$TABLE3                                                         RADSINCLUD
        5200.   0.      75.     0.      375.                    UPW
        5000.   75.     100.    375.    650.                    CRSW
        9200.   100.    100.    650.    650.                    DWNW
        5000.   100.    80.     650.    375.                    BASE
        4000.   80.     0.      375.    0.                      FINL
        500.    100.    9.      80.     1500.                   RDUS
$TABLE4                                                         RADSINCLUD
        4000.   0.      75.     0.      375.                    UPW
        5000.   75.     100.    375.    650.                    CRSW
        9200.   100.    100.    650.    650.                    DWNW
        5000.   100.    80.     650.    375.                    BASE
        5200.   80.     0.      375.    0.                      FINL
        500.    100.    9.      80.     1500.                   RDUS

$TABLE5                                                         RADSINCLUD
        5200.   0.      75.     0.      375.                    UPW
        5000.   75.     100.    375.    650.                    CRSW
        9200.   100.    100.    650.    650.                    DWNW
        5000.   100.    80.     650.    375.                    BASE
        4000.   80.     0.      375.    0.                      FINL
        500.    100.    15.     80.     1500.                   RDUS
$TABLE6                                                         RADSINCLUD
        4000.   0.      75.     0.      375.                    UPW
        5000.   75.     100.    375.    650.                    CRSW
        9200.   100.    100.    650.    650.                    DWNW
        5000.   100.    80.     650.    375.                    BASE
        5200.   80.     0.      375.    0.                      FINL
        500.    100.    15.     80.     1500.                   RDUS
$ACTON6         1       1       2.08    .09                     OH58LHP
$ACTON6         1       3       14.56   .63                     OH58LHP
$ACTON6         1       5       4.16    .18                     OH58LHP
$ACTON6         2       1       2.08    .09                     OH58LHP
$ACTON6         2       3       14.56   .63                     OH58LHP
$ACTON6         2       5       4.16    .18                     OH58LHP
$ACTON6         3       1       2.08    .09                     OH58RHP
$ACTON6         3       3       14.56   .63                     OH58RHP
$ACTON6         3       5       4.16    .18                     OH58RHP
$ACTON6         4       1       2.08    .09                     OH58RHP
$ACTON6         4       3       14.56   .63                     OH58RHP
$ACTON6         4       5       4.16    .18                     OH58RHP
$ACTON24        10      2       3.12    .11                     OH58RHP
$ACTON24        10      4       21.84   .77                     OH58RHP
$ACTON24        10      6       6.24    .22                     OH58RHP
$ACTON24        11      2       3.12    .11                     OH58RHP
$ACTON24        11      4       21.84   .77                     OH58RHP
$ACTON24        11      6       6.24    .22                     OH58RHP
$ACTON24        12      2       3.12    .11                     OH58LHP
$ACTON24        12      4       21.84   .77                     OH58LHP
```

```
$ACTON24        12        6        6.24      .22                                          OH58LHP
$ACTON24        13        2        3.12      .11                                          OH58LHP
$ACTON24        13        4        21.84     .77                                          OH58LHP
$ACTON24        13        6        6.24      .22                                          OH5LHP
PLOT  2.        24000.    62.      66.       70.       74.
END

****************        NOISEMAP DRIVER PROGRAM FOR HELICOPTERS        ****************


           DEFAULT IMPULSE CORRECTIONS ARE IN EFFECT

           TYPE OF FLIGHT                 IMPULSE CORRECTED?
           --------------                 ------------------
           CLIMBING                              YES
           LEVEL                                 YES
           DESCENDING                            YES

 *** ALIGN 1.0
 *** UNITS                                                                                METRIC
 *** AIRFLD-6446.8 4983.2  -2522.355097.65                                                WEST
 ***       EXAMPLE 2
 *** UNITS                                                                                ENGLISH

           +++ NEW ENTRY IN RUNWAY LIBRARY

                    RUNWAY NUMBER IS  1
                    RUNWAY HEADING IS  6
                    START OF RUNWAY IS (     1000,     1375)
                    END OF RUNWAY IS (     1346,     1575)
                    TAKEOFF THRESHOLD DISPLACEMENT IS      199
                    LANDING THRESHOLD DISPLACEMENT IS      199
                    LENGTH OF RUNWAY IS       399

           RECIPROCAL TO RUNWAY NUMBER  1 HAS BEEN ENTERED AS THE
           2TH ENTRY OF RUNWAY LIBRARY


                    RUNWAY NUMBER IS 10
                    RUNWAY HEADING IS 24
                    START OF RUNWAY IS (     1346,     1575)
                    END OF RUNWAY IS (     1000,     1375)
                    TAKEOFF THRESHOLD DISPLACEMENT IS      199
                    LANDING THRESHOLD DISPLACEMENT IS      199
                    LENGTH OF RUNWAY IS       399

           +++ NEW ENTRY IN RUNWAY LIBRARY
```

```
          RUNWAY NUMBER IS  2
          RUNWAY HEADING IS  6
          START OF RUNWAY IS (     1000,     1259)
          END OF RUNWAY IS (     1346,     1459)
          TAKEOFF THRESHOLD DISPLACEMENT IS      199
          LANDING THRESHOLD DISPLACEMENT IS      199
          LENGTH OF RUNWAY IS       399


RECIPROCAL TO RUNWAY NUMBER  2 HAS BEEN ENTERED AS THE
4TH ENTRY OF RUNWAY LIBRARY

          RUNWAY NUMBER IS 11
          RUNWAY HEADING IS 24
          START OF RUNWAY IS (     1346,     1459)
          END OF RUNWAY IS (     1000,     1259)
          TAKEOFF THRESHOLD DISPLACEMENT IS      199
          LANDING THRESHOLD DISPLACEMENT IS      199
          LENGTH OF RUNWAY IS       399

+++ NEW ENTRY IN RUNWAY LIBRARY

          RUNWAY NUMBER IS  3
          RUNWAY HEADING IS  6
          START OF RUNWAY IS (     1000,     1115)
          END OF RUNWAY IS (     1346,     1315)
          TAKEOFF THRESHOLD DISPLACEMENT IS      199
          LANDING THRESHOLD DISPLACEMENT IS      199
          LENGTH OF RUNWAY IS       399

RECIPROCAL TO RUNWAY NUMBER  3 HAS BEEN ENTERED AS THE
6TH ENTRY OF RUNWAY LIBRARY

          RUNWAY NUMBER IS 12
          RUNWAY HEADING IS 24
          START OF RUNWAY IS (     1346,     1315)
          END OF RUNWAY IS (     1000,     1115)
          TAKEOFF THRESHOLD DISPLACEMENT IS      199
          LANDING THRESHOLD DISPLACEMENT IS      199
          LENGTH OF RUNWAY IS       399

+++ NEW ENTRY IN RUNWAY LIBRARY

          RUNWAY NUMBER IS  4
          RUNWAY HEADING IS  6
          START OF RUNWAY IS (     1000,     1000)
          END OF RUNWAY IS (     1346,     1200)
          TAKEOFF THRESHOLD DISPLACEMENT IS      199
          LANDING THRESHOLD DISPLACEMENT IS      199
          LENGTH OF RUNWAY IS       399

RECIPROCAL TO RUNWAY NUMBER  4 HAS BEEN ENTERED AS THE
8TH ENTRY OF RUNWAY LIBRARY
```

RUNWAY NUMBER IS 13
RUNWAY HEADING IS 24
START OF RUNWAY IS (1346, 1200)
END OF RUNWAY IS (1000, 1000)
TAKEOFF THRESHOLD DISPLACEMENT IS 199
LANDING THRESHOLD DISPLACEMENT IS 199
LENGTH OF RUNWAY IS 399

+++ PATTERN DEFINITION TABLE (NUMBER 1)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	3700.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	2500.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 6.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1500. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 2)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	2500.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	3700.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 6.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1500. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 3)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	3700.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	2500.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 9.0 DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS - 1500. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 4)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	2500.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	3700.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 9.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1500. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 5)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	3700.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	2500.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 15.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1500. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 6)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	2500.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	3700.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 15.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1500. (FEET)

+++ GENERATE "NOISEMAP" CARD(S)

RUNWAY HEADING IS 6.
RUNWAY NUMBER IS 1.
PATTERN INDEX IS 1.
NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS 2.080
NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS .090
HELICOPTER IS OH58
PATTERN TURNS LEFT
PATTERN STORED IN TABLE

********************** ERROR IN SUBROUTINE ALTUDE **********************

RUNWAY OVERSHOT ON LANDING
NEE TO INCREASE DESCENT ANGLE--NOW AT 6.00

****

+++ NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
LIBRARY NOW CONTAINS 1 TAKEOFF DESCRIPTOR

==> TODSCR	611	1	0	1	1500		6112		-1902OH58PTRN
	6116	0							OH58PTRN
==> DSEL	1.	0.0	0.	0.0	150000.	0.0	0.	0.0	PTRN
==> RUNWAY	1000	1375	1346	1575	199	199	6.00		06
==> FLTTRK	3700	0	1500	-90	2000	0	1500		-90TKOF LHP 1
	6200	0	1500	-90	2000	0	1500		-90TKOF LHP 2
	2500	0							TKOF LHP
==> FLIGHT	611	1		2.08	.09				OH58 6 1

+++ GENERATE "NOISEMAP" CARD(S)

```
                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  1.
                    PATTERN INDEX IS  3.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   14.560
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .630
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT
                    PATTERN STORED IN TABLE

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  2 TAKEOFF DESCRIPTORS
==> TODSCR     611      2       1       1    1500             6112   24562OH58PTRN *
              6116   25824                                                OH58PTRN
==> ALTUDE       1      0       0       0      75     375     6056   375PTRN 558 *
              8056    650   18968     650   20968     375    23457   375PTRN 558 *
             25824      0       0       0       0       0        0     0PTRN 558

==> FLIGHT     611      2           14.56     .63                       OH58 6 1


     +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  1.
                    PATTERN INDEX IS  5.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    4.160
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .180
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT
                    PATTERN STORED IN TABLE

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  3 TAKEOFF DESCRIPTORS
==> TODSCR     611      3       2       1    1500             6112   25078OH58PTRN *
              6116   25824                                                OH58PTRN
==> ALTUDE       2      0       0       0      75     375     6056   375PTRN 558 *
              8056    650   18968     650   20968     375    24425   375PTRN 558 *
             25824      0       0       0       0       0        0     0PTRN 558

==> FLIGHT     611      3            4.16     .18                       OH58 6 1


     +++  GENERATE "NOISEMAP" CARD(S)
```

```
                         RUNWAY HEADING IS  6.
                         RUNWAY NUMBER IS  2.
                         PATTERN INDEX IS  1.
                         NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    2.080
                         NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .090
                         HELICOPTER IS OH58
                         PATTERN TURNS LEFT
                         PATTERN STORED IN TABLE

*********************    ERROR IN SUBROUTINE ALTUDE    ********************

RUNWAY OVERSHOT ON LANDING
NEED TO INCREASE DESCENT ANGLE--NOW AT  6.00

***************************************************************************

      +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
           LIBRARY NOW CONTAINS  4 TAKEOFF DESCRIPTORS

 ==> TODSCR     611       4        2        1     1500              6112   23922OH58PTRN *
               6116   25824                                                     OH58PTRN

 ==> RUNWAY    1000    1259     1346     1459      199      199     6.00          06

 ==> FLTTRK    3700       0     1500      -90     2000        0     1500     -90TKOF LHP 1
               6200       0     1500      -90     2000        0     1500     -90TKOF LHP 2
               2500       0                                                     TKOF LHP

 ==> FLIGHT     611       4              2.08      .09                          OH58 6 2


      +++  GENERATE "NOISEMAP" CARD(S)



                         RUNWAY HEADING IS  6.
                         RUNWAY NUMBER IS  2.
                         PATTERN INDEX IS  3.
                         NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   14.560
                         NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .630
                         HELICOPTER IS OH58
                         PATTERN TURNS LEFT
                         PATTERN STORED IN TABLE

 ==> FLIGHT     611       2             14.56      .63                          OH58 6 2


      +++  GENERATE "NOISEMAP" CARD(S)
```

```
                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  2.
                    PATTERN INDEX IS  5.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    4.160
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .180
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT
                    PATTERN STORED IN TABLE

 ==> FLIGHT     611       3           4.16     .18                       OH58 6 2


      +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  3.
                    PATTERN INDEX IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    2.080
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .090
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT
                    PATTERN STORED IN TABLE

********************    ERROR IN SUBROUTINE ALTUDE    ********************

RUNWAY OVERSHOT ON LANDING
NEED TO INCREASE DESCENT ANGLE--NOW AT  6.00

**************************************************************************

 ==> RUNWAY     1000    1115    1346    1315     199     199    6.00        06


 ==> FLTTRK     3700       0    1500      90    2000       0    1500     90TKOF RHP 1
                6200       0    1500      90    2000       0    1500     90TKOF RHP 2
                2500       0                                               TKOF RHP

 ==> FLIGHT      611       4            2.08     .09                       OH58 6 3


      +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  3.
                    PATTERN INDEX IS  3.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   14.560
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .630
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT
                    PATTERN STORED IN TABLE
```

```
==> FLIGHT     611       2            14.56     .63                            OH58 6 3


     +++  GENERATE "NOISEMAP" CARD(S)

                         RUNWAY HEADING IS  6.
                         RUNWAY NUMBER IS  3.
                         PATTERN INDEX IS  5.
                         NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    4.160
                         NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .180
                         HELICOPTER IS OH58
                         PATTERN TURNS RIGHT
                         PATTERN STORED IN TABLE

==> FLIGHT     611       3             4.16     .18                            OH58 6 3


     +++  GENERATE "NOISEMAP" CARD(S)

                         RUNWAY HEADING IS  6.
                         RUNWAY NUMBER IS  4.
                         PATTERN INDEX IS  1.
                         NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    2.080
                         NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .090
                         HELICOPTER IS OH58
                         PATTERN TURNS RIGHT
                         PATTERN STORED IN TABLE

*********************    ERROR IN SUBROUTINE ALTUDE    ********************

RUNWAY OVERSHOT ON LANDING
NEED TO INCREASE DESCENT ANGLE--NOW AT  6.00

***************************************************************************

==> RUNWAY     1000    1000    1346    1200     199     199    6.00          06

==> FLTTRK     3700       0    1500      90    2000       0    1500     90TKOF RHP 1
               6200       0    1500      90    2000       0    1500     90TKOF RHP 2
               2500       0                                               TKOF RHP

==> FLIGHT     611       4             2.08     .09                            OH58 6 4


     +++  GENERATE "NOISEMAP" CARD(S)
```

```
                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  4.
                    PATTERN INDEX IS  3.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   14.560
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .630
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT
                    PATTERN STORED IN TABLE

==> FLIGHT     611        2            14.56     .63                        OH58 6 4


     +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  4.
                    PATTERN INDEX IS  5.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    4.160
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .180
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT
                    PATTERN STORED IN TABLE

==> FLIGHT     611        3             4.16     .18                        OH58 6 4


     +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 10.
                    PATTERN INDEX IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    3.120
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .110
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT
                    PATTERN STORED IN TABLE

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  5 TAKEOFF DESCRIPTORS

==> TODSCR      611       5       3       1    1500           6112   23922OH58PTRN *
               6116   25824                                              OH58PTRN
==> ALTUDE        3       0       0       0      75     375   4856    375PTRN 558 *
               6856     650   17768     650   19768     375  22257    375PTRN 558 *
              25824       0       0       0       0       0      0      0PTRN 558

==> RUNWAY     1346    1575    1000    1375     199     199   6.00         24

==> FLTTRK     2500       0    1500      90    2000       0   1500     90TKOF RHP 1
               6200       0    1500      90    2000       0   1500     90TKOF RHP 2
               3700       0                                              TKOF RHP
```

```
==> FLIGHT     611        5              3.12      .11                          OH582410


     +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 10.
                    PATTERN INDEX IS  4.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   21.840
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .770
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT
                    PATTERN STORED IN TABLE

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  6 TAKEOFF DESCRIPTORS

==> TODSCR     611        6        4        1     1500             6112   24562OH58PTRN *
              6116    25824                                                   OH58PTRN
==> ALTUDE       4        0        0        0       75      375     4856     375PTRN 558 *
              6856      650    17768      650    19768      375    23457     375PTRN 558 *
             25824        0        0        0        0        0        0       0PTRN 558

==> FLIGHT     611        6             21.84      .77                          OH582410


     +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 10.
                    PATTERN INDEX IS  6.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    6.240
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .220
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT
                    PATTERN STORED IN TABLE

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  7 TAKEOFF DESCRIPTORS

==> TODSCR     611        7        5        1     1500             6112   25078OH58PTRN *
              6116    25824                                                   OH58PTRN
==> ALTUDE       5        0        0        0       75      375     4856     375PTRN 558 *
              6856      650    17768      650    19768      375    24425     375PTRN 558 *
             25824        0        0        0        0        0        0       0PTRN 558

==> FLIGHT     611        7              6.24      .22                          OH582410


     +++  GENERATE "NOISEMAP" CARD(S)
```

```
                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 11.
                    PATTERN INDEX IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    3.120
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .110
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT
                    PATTERN STORED IN TABLE

==> RUNWAY     1346     1459     1000     1259     199     199     6.00          24

==> FLTTRK     2500        0     1500       90    2000       0     1500     90TKOF RHP 1
               6200        0     1500       90    2000       0     1500     90TKOF RHP 2
               3700        0                                                  TKOF RHP

==> FLIGHT      611        5              3.12     .11                        OH582411


     +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 11.
                    PATTERN INDEX IS  4.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   21.840
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .770
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT
                    PATTERN STORED IN TABLE

==> FLIGHT      611        6             21.84     .77                        OH582411


     +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 11.
                    PATTERN INDEX IS  6.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    6.240
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .220
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT
                    PATTERN STORED IN TABLE

==> FLIGHT      611        7              6.24     .22                        OH582411


     +++  GENERATE "NOISEMAP" CARD(S)
```

```
                     RUNWAY HEADING IS 24.
                     RUNWAY NUMBER IS 12.
                     PATTERN INDEX IS  2.
                     NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    3.120
                     NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .110
                     HELICOPTER IS OH58
                     PATTERN TURNS LEFT
                     PATTERN STORED IN TABLE

==> RUNWAY     1346    1315    1000    1115     199     199    6.00         24

==> FLTTRK     2500       0    1500     -90    2000       0    1500     -90TKOF LHP 1
               6200       0    1500     -90    2000       0    1500     -90TKOF LHP 2
               3700       0                                                TKOF LHP

==> FLIGHT      611       5            3.12     .11                        OH582412


     +++  GENERATE "NOISEMAP" CARD(S)

                     RUNWAY HEADING IS 24.
                     RUNWAY NUMBER IS 12.
                     PATTERN INDEX IS  4.
                     NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   21.840
                     NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .770
                     HELICOPTER IS OH58
                     PATTERN TURNS LEFT
                     PATTERN STORED IN TABLE

==> FLIGHT      611       6           21.84     .77                        OH582412


     +++  GENERATE "NOISEMAP" CARD(S)

                     RUNWAY HEADING IS 24.
                     RUNWAY NUMBER IS 12.
                     PATTERN INDEX IS  6.
                     NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    6.240
                     NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .220
                     HELICOPTER IS OH58
                     PATTERN TURNS LEFT
                     PATTERN STORED IN TABLE

==> FLIGHT      611       7            6.24     .22                        OH582412


     +++  GENERATE "NOISEMAP" CARD(S)
```

```
                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 13.
                    PATTERN INDEX IS  2.
                    NUMBER OF DAILY DAYTIMEPATTERN ITERATIONS IS    3.120
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .110
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT
                    PATTERN STORED IN TABLE

==> RUNWAY    1346    1200    1000    1000     199     199    6.00          24

==> FLTTRK    2500       0    1500     -90    2000       0    1500     -90TKOF LHP 1
              6200       0    1500     -90    2000       0    1500     -90TKOF LHP 2
              3700       0                                                TKOF LHP

==> FLIGHT     611       5            3.12     .11                         OH582413


     +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 13.
                    PATTERN INDEX IS  4.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   21.840
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .770
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT
                    PATTERN STORED IN TABLE

==> FLIGHT     611       6           21.84     .77                         OH582413


     +++  GENERATE "NOISEMAP" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 13.
                    PATTERN INDEX IS  6.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    6.240
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .220
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT
                    PATTERN STORED IN TABLE

==> FLIGHT     611       7            6.24     .22                         OH582413
*** PLOT  2.      24000.  62.     66.     70.     74.
*** END
*** END
```

THERE WERE 0 WARNINGS AND 4 ERRORS IN THIS RUN

78 CARDS WERE READ IN AND 86 CARDS WERE WRITTEN TO TAPE 7 DURING THIS SESSION

************************ END OF DRIVER PROGRAM ************************

Note the errors associated with the use of $TABLE 1 at a 6-degree descent glide slope.

+++ PATTERN DEFINITION TABLE (NUMBER 1)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	3700.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	2500.0	80.0	0.0	375.0	0.0

```
TAKE OFF CLIMB RATE =  500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE =  6.0 (DEGREES)
SPEED AT START OF DESCENT =  80. (KNOTS)
TURN RADIUS = 1500. (FEET)
```

A helicopter can descend only 2500 x tan (6 degrees) = 262 ft during the 2500 ft long final leg. This means the helicopter must have started descending during the turn. Change $TABLE 1 to reflect the descent during the turn:

```
$TABLE1                                                   RADSINCLUD
      5200.   0.     75.    0.     375.                   UPW
      5000.   75.    100.   375.   650.                   CRSW
      9200.   100.   100.   650.   650.                   DWNW
      5000.   100.   80.    650.   375.                   BASE
      4000.   80.    0.     262.   0.                     FINL
      500.    100.   6.     80.    1500.                  RDUS
```

The DRIVER output for this new file is the following:

**************** NOISEMAP3.4 DRIVER PROGRAM FOR HELICOPTERS ****************

```
          DEFAULT IMPULSE CORRECTIONS ARE IN EFFECT

          TYPE OF FLIGHT                IMPULSE CORRECTED?
          --------------                ------------------
          CLIMBING                             YES
          LEVEL                                YES
          DESCENDING                           YES

*** ALIGN 1.0
*** UNITS                                                                  METRIC
*** AIRFLD-6446.8 4983.2  -2522.355097.65                                  WEST
***       EXAMPLE 2
*** PROCES
*** UNITS                                                                  ENGLISH

          +++ NEW ENTRY IN RUNWAY LIBRARY

                    RUNWAY NUMBER IS  1
                    RUNWAY HEADING IS  6
                    START OF RUNWAY IS (     1000,     1375)
                    END OF RUNWAY IS (     1346,     1575)
                    TAKEOFF THRESHOLD DISPLACEMENT IS      199
                    LANDING THRESHOLD DISPLACEMENT IS      199
                    LENGTH OF RUNWAY IS       399

RECIPROCAL TO RUNWAY NUMBER  1 HAS BEEN ENTERED AS THE  2TH ENTRY OF RUNWAY LIBRARY

                    RUNWAY NUMBER IS 10
                    RUNWAY HEADING IS 24
                    START OF RUNWAY IS (     1346,     1575)
                    END OF RUNWAY IS (     1000,     1375)
                    TAKEOFF THRESHOLD DISPLACEMENT IS      199
                    LANDING THRESHOLD DISPLACEMENT IS      199
                    LENGTH OF RUNWAY IS       399

          +++ NEW ENTRY IN RUNWAY LIBRARY

                    RUNWAY NUMBER IS  2
                    RUNWAY HEADING IS  6
                    START OF RUNAY IS (     1000,     1259)
                    END OF RUNWAY IS (     1346,     1459)
                    TAKEOFF THRESHOLD DISPLACEMENT IS      199
                    LANDING THRESHOLD DISPLACEMENT IS      199
                    LENGTH OF RUNWAY IS       399

RECIPROCAL TO RUNWAY NUMBER  2 HAS BEEN ENTERED AS THE  4TH ENTRY OF RUNWAY LIBRARY
```

```
          RUNWAY NUMBER IS 11
          RUNWAY HEADING IS 24
          START OF RUNWAY IS (     1346,     1459)
          END OF RUNWAY IS (     1000,     1259)
          TAKEOFF THRESHOLD DISPLACEMENT IS      199
          LANDING THRESHOLD DISPLACEMENT IS      199
          LENGTH OF RUNWAY IS       399

     +++ NEW ENTRY IN RUNWAY LIBRARY

          RUNWAY NUMBER IS  3
          RUNWAY HEADING IS  6
          START OF RUNWAY IS (     1000,     1115)
          END OF RUNWAY IS (     1346,     1315)
          TAKEOFF THRESHOLD DISPLACEMENT IS      199
          LANDING THRESHOLD DISPLACEMENT IS      199
          LENGTH OF RUNWAY IS       399

RECIPROCAL TO RUNWAY NUMBER  3 HAS BEEN ENTERED AS THE  6TH ENTRY OF RUNWAY LIBRARY

          RUNWAY NUMBER IS 12
          RUNWAY HEADING IS 24
          START OF RUNWAY IS (     1346,     1315)
          END OF RUNWAY IS (     1000,     1115)
          TAKEOFF THRESHOLD DISPLACEMENT IS      199
          LANDING THRESHOLD DISPLACEMENT IS      199
          LENGTH OF RUNWAY IS       399

     +++ NEW ENTRY IN RUNWAY LIBRARY

          RUNWAY NUMBER IS  4
          RUNWAY HEADING IS  6
          START OF RUNWAY IS (     1000,     1000)
          END OF RUNWAY IS (     1346,     1200)
          TAKEOFF THRESHOLD DISPLACEMENT IS      199
          LANDING THRESHOLD DISPLACEMENT IS      199
          LENGTH OF RUNWAY IS       399

RECIPROCAL TO RUNWAY NUMBER  4 HAS BEEN ENTERED AS THE  8TH ENTRY OF RUNWAY LIBRARY

          RUNWAY NUMBER IS 13
          RUNWAY HEADING IS 24
          START OF RUNWAY IS (     1346,     1200)
          END OF RUNWAY IS (     1000,     1000)
          TAKEOFF THRESHOLD DISPLACEMENT IS      199
          LANDING THRESHOLD DISPLACEMENT IS      199
          LENGTH OF RUNWAY IS       399
```

+++ PATTERN DEFINITION TABLE (NUMBER 1)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	3700.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	2500.0	80.0	0.0	262.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 6.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1500. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 2)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	2500.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	3700.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 6.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1500. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 3)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	3700.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	2500.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 9.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1500. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 4)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	2500.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	3700.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 9.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1500. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 5)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	3700.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	2500.0	80.0	0.0	375.0	0.0

TAKE OFF CLIMB RATE = 500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 15.0 (DEGREES)
SPEED AT START OF DESCENT = 80. (KNOTS)
TURN RADIUS = 1500. (FEET)

+++ PATTERN DEFINITION TABLE (NUMBER 6)

PATTERN SEGMENT	LENGTH	STARTING SPEED	ENDING SPEED	STARTING HEIGHT	ENDING HEIGHT
UPW	2500.0	0.0	75.0	0.0	375.0
CRSW	2000.0	75.0	100.0	375.0	650.0
DWNW	6200.0	100.0	100.0	650.0	650.0
BASE	2000.0	100.0	80.0	650.0	375.0
FINL	3700.0	80.0	0.0	375.0	0.0

AD-A139 028 USER MANUAL FOR DRIVER PROGRAM(U) CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN IL B SWAIN ET AL. JAN 84 CERL-TR-N-162

2/2

UNCLASSIFIED F/G 9/2 NL

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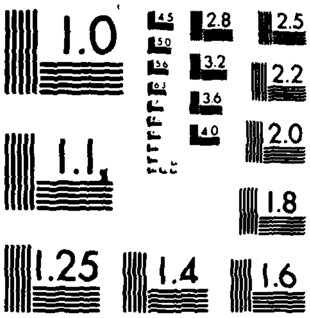

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```
TAKE OFF CLIMB RATE =  500. (FEET PER MINUTE)
SPEED UPON REACHING PATTERN ALTITUDE = 100. (KNOTS)
LANDING DESCENT GLIDE SLOPE = 15.0 (DEGREES)
SPE
AT START OF DESCENT =  80. (KNOTS)
TURN RADIUS = 1500. (FEET)


+++  GENERATE "NOISEMAP3.4" CARD(S)

          RUNWAY HEADING IS  6.
          RUNWAY NUMBER IS  1.
          PATTERN DEFINITION TABLE NUMBER IS  1.
          NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    2.080
          NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .090
          HELICOPTER IS OH58
          PATTERN TURNS LEFT

+++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
     LIBRARY NOW CONTAINS  1 TAKEOFF DESCRIPTOR
==> TODSCR      611       1       1       1    1500            6112    23922OH58PTRN *
               6116   25824                                                 OH58PTRN
==> ALTUDE        1       0       0       0      75     375    6056     375PTRN 558 *
==>            8056     650   18968     650   20968     375   23324     262PTRN 558 *
==>           23332     262   25824       0       0       0       0       0PTRN 558
==> DSEL         1.     0.0      0.     0.0 150000.     0.0      0.     0.0     PTRN

==> RUNWAY     1000    1375    1346    1575     199     199    6.00           06

==> FLTTRK     3700       0    1500     -90    2000       0    1500     -90TKOF LHP 1
               6200       0    1500     -90    2000       0    1500     -90TKOF LHP 2
               2500       0                                                TKOF LHP

==> FLIGHT      611       1            2.08     .09                        OH58 6 1


+++  GENERATE "NOISEMAP3.4" CARD(S)

          RUNWAY HEADING IS  6.
          RUNWAY NUMBER IS  1.
          PATTERN DEFINITION TABLE NUMBER IS  3.
          NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   14.560
          NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .630
          HELICOPTER IS OH58
          PATTERN TURNS LEFT

+++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
     LIBRARY NOW CONTAINS  2 TAKEOFF DESCRIPTORS

==> TODSCR      611       2       2       1    1500            6112    24562OH58PTRN *
               6116   25824                                                 OH58PTRN
==> ALTUDE        2       0       0       0      75     375    6056     375PTRN 558 *
```

```
==>            8056     650   18968     650   20968     375   23457      375PTRN 558 *
==>           25824       0       0       0       0       0       0        0PTRN 558

==> FLIGHT      611       2            14.56     .63                       OH58 6 1
```

```
     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  1.
                    PATTERN DEFINITION TABLE NUMBER IS  5.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    4.160
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .180
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  3 TAKEOFF DESCRIPTORS
```

```
==> TODSCR      611       3       3       1    1500            6112   25078OH58PTRN *
               6116   25824                                              OH58PTRN
==> ALTUDE        3       0       0       0      75     375    6056      375PTRN 558 *
==>            8056     650   18968     650   20968     375   24425      375PTRN 558 *
==>           25824       0       0       0       0       0       0        0PTRN 558

==> FLIGHT      611       3             4.16     .18                       OH58 6 1
```

```
     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  2.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    2.080
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .090
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT
```

```
==> RUNWAY     1000    1259    1346    1459     199     199    6.00           06

==> FLTTRK     3700       0    1500     -90    2000       0    1500     -90TKOF LHP 1
               6200       0    1500     -90    2000       0    1500     -90TKOF LHP 2
               2500       0                                                TKOF LHP

==> FLIGHT      611       1             2.08     .09                       OH58 6 2
```

```
     +++  GENERATE "NOISEMAP3.4" CARD(S)
```

```
                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  2.
                    PATTERN DEFINITION TABLE NUMBER IS  3.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   14.560
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .630
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT

==> FLIGHT     611       2          14.56     .63                        OH58 6 2


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  2.
                    PATTERN DEFINITION TABLE NUMBER IS  5.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    4.160
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .180
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT

==> FLIGHT     611       3           4.16     .18                        OH58 6 2


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  3.
                    PATTERN DEFINITION TABLE NUMBER IS  1.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    2.080
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .090
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT

==> RUNWAY    1000    1115    1346    1315     199     199    6.00        06

==> FLTTRK    3700       0    1500      90    2000       0    1500     90TKOF RHP 1
              6200       0    1500      90    2000       0    1500     90TKOF RHP 2
              2500       0                                              TKOF RHP

==> FLIGHT     611       1           2.08     .09                        OH58 6 3


     +++  GENERATE "NOISEMAP3.4" CARD(S)
```

```
                         RUNWAY HEADING IS  6.
                         RUNWAY NUMBER IS  3.
                         PATTERN DEFINITION TABLE NUMBER IS  3.
                         NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   14.560
                         NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .630
                         HELICOPTER IS OH58
                         PATTERN TURNS RIGHT

==> FLIGHT     611      2          14.56     .63                       OH58 6 3


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                         RUNWAY HEADING IS  6.
                         RUNWAY NUMBER IS  3.
                         PATTERN DEFINITION TABLE NUMBER IS  5.
                         NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    4.160
                         NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .180
                         HELICOPTER IS OH58
                         PATTERN TURNS RIGHT

==> FLIGHT     611      3           4.16     .18                       OH58 6 3


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                         RUNWAY HEADING IS  6.
                         RUNWAY NUMBER IS  4.
                         PATTERN DEFINITION TABLE NUMBER IS  1.
                         NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    2.080
                         NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .090
                         HELICOPTER IS OH58
                         PATTERN TURNS RIGHT

==> RUNWAY    1000   1000   1346   1200    199    199   6.00        06

==> FLTTRK    3700      0   1500     90   2000      0   1500     90TKOF RHP 1
              6200      0   1500     90   2000      0   1500     90TKOF RHP 2
              2500      0                                          TKOF RHP

==> FLIGHT     611      1           2.08     .09                       OH58 6 4


     +++  GENERATE "NOISMAP3.4" CARD(S)
```

```
                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  4.
                    PATTERN DEFINITION TABLE NUMBER IS  3.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   14.560
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .630
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT

==> FLIGHT     611       2           14.56     .63                          OH58 6 4


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS  6.
                    RUNWAY NUMBER IS  4.
                    PATTERN DEFINITION TABLE NUMBER IS  5.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    4.160
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .180
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT

==> FLIGHT     611       3            4.16     .18                          OH58 6 4


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 10.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    3.120
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .110
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  4 TAKEOFF DESCRIPTORS

==> TODSCR     611       4       4       1    1500            6112   23922OH58PTRN *
              6116   25824                                                OH58PTRN
==> ALTUDE       4       0       0       0      75     375    4856    375PTRN 558 *
==>           6856     650   17768     650   19768     375   22257    375PTRN 558 *
==>          25824       0       0       0       0       0       0      0PTRN 558

==> RUNWAY    1346    1575    1000    1375     199     199    6.00         24

==> FLTTRK    2500       0    1500      90    2000       0    1500     90TKOF RHP 1
              6200       0    1500      90    2000       0    1500     90TKOF RHP 2
              3700       0                                                TKOF RHP

==> FLIGHT     611       4            3.12     .11                          OH582410
```

```
     +++  GENERATE "NOISEMAP3.4" CARD(S)

                         RUNWAY HEADING IS 24.
                         RUNWAY NUMBER IS 10.
                         PATTERN DEFINITION TABLE NUMBER IS  4.
                         NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   21.840
                         NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .770
                         HELICOPTER IS OH58
                         PATTERN TURNS RIGHT

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  5 TAKEOFF DESCRIPTORS

==> TODSCR      611       5       5       1    1500            6112   24562OH58PTRN *
               6116   25824                                                OH58PTRN
==> ALTUDE        5       0       0       0      75     375    4856   375PTRN 558 *
==>            6856     650   17768     650   19768     375   23457   375PTRN 558 *
==>           25824       0       0       0       0       0       0     0PTRN 558

==> FLIGHT      611       5           21.84     .77                       OH582410


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                         RUNWAY HEADING IS 24.
                         RUNWAY NUMBER IS 10.
                         PATTERN DEFINITION TABLE NUMBER IS  6.
                         NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    6.240
                         NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .220
                         HELICOPTER IS OH58
                         PATTERN TURNS RIGHT

     +++  NEW TAKEOFF DESCRIPTOR ADDED TO LIBRARY
          LIBRARY NOW CONTAINS  6 TAKEOFF DESCRIPTORS

==> TODSCR      611       6       6       1    1500            6112   25078OH58PTRN *
               6116   25824                                                OH58PTRN
==> ALTUDE        6       0       0       0      75     375    4856   375PTRN 558 *
==>            6856     650   17768     650   19768     375   24425   375PTRN 558 *
==>           25824       0       0       0       0       0       0     0PTRN 558

==> FLIGHT      611       6            6.24     .22                       OH582410


     +++  GENERATE "NOISEMAP3.4" CARD(S)
```

```
                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    3.120
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .110
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT

==> RUNWAY    1346    1459    1000    1259     199     199    6.00          24

==> FLTTRK    2500       0    1500      90    2000       0    1500     90TKOF RHP 1
              6200       0    1500      90    2000       0    1500     90TKOF RHP 2
              3700       0                                               TKOF RHP

==> FLIGHT     611       4            3.12     .11                       OH582411


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  4.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   21.840
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .770
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT

==> FLIGHT     611       5           21.84     .77                       OH582411


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 11.
                    PATTERN DEFINITION TABLE NUMBER IS  6.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    6.240
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .220
                    HELICOPTER IS OH58
                    PATTERN TURNS RIGHT

==> FLIGHT     611       6            6.24     .22                       OH582411


     +++  GENERATE "NOISEMAP3.4" CARD(S)
```

```
                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 12.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    3.120
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .110
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT

==> RUNWAY    1346    1315    1000    1115     199     199    6.00          24

==> FLTTRK    2500       0    1500     -90    2000       0    1500      -90TKOF LHP 1
              6200       0    1500     -90    2000       0    1500      -90TKOF LHP 2
              3700       0                                                  TKOF LHP

== FLIGHT     611       4             3.12     .11                          OH582412


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 12.
                    PATTERN DEFINITION TABLE NUMBER IS  4.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   21.840
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .770
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT

==> FLIGHT     611       5            21.84     .77                         OH582412


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 12.
                    PATTERN DEFINITION TABLE NUMBER IS  6.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    6.240
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .220
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT

==> FLIGHT     611       6             6.24     .22                         OH582412


     +++  GENERATE "NOISEMAP3.4" CARD(S)
```

```
                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 13.
                    PATTERN DEFINITION TABLE NUMBER IS  2.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    3.120
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .110
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT

==> RUNWAY    1346    1200    1000    1000     199     199    6.00          24

==> FLTTRK    2500       0    1500     -90    2000       0    1500     -90TKOF LHP 1
              6200       0    1500     -90    2000       0    1500     -90TKOF LHP 2
              3700       0                                                TKOF LHP

==> FLIGHT     611       4            3.12     .11                        OH582413


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 13.
                    PATTERN DEFINITION TABLE NUMBER IS  4.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS   21.840
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .770
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT

==> FLIGHT     611       5           21.84     .77                        OH582413


     +++  GENERATE "NOISEMAP3.4" CARD(S)

                    RUNWAY HEADING IS 24.
                    RUNWAY NUMBER IS 13.
                    PATTERN DEFINITION TABLE NUMBER IS  6.
                    NUMBER OF DAILY DAYTIME PATTERN ITERATIONS IS    6.240
                    NUMBER OF DAILY NIGHTTIME PATTERN ITERATIONS IS    .220
                    HELICOPTER IS OH58
                    PATTERN TURNS LEFT

==> FLIGHT     611       6            6.24     .22                        OH582413
*** PLOT  2.     24000.  62.     66.     70.     74.
*** END


**********************     END OF DRIVER PROGRAM     **********************
```

The NOISEMAP3.4 input produced at the same time as the above informative DRIVER output is the following:

```
ALIGN 1.0
UNITS                                                                       METRIC
AIRFLD-6446.8 4983.2   -2522.355097.65                                      WEST
      EXAMPLE 2
PROCES
UNITS                                                                       ENGLISH
TODSCR     611        1        1        1     1500             6112   23922OH58PTRN *
          6116    25824                                                      OH58PTRN
ALTUDE       1        0        0        0       75      375    6056     375PTRN 558 *
          8056      650    18968      650    20968      375   23324     262PTRN 558 *
         23332      262    25824        0        0        0       0       0PTRN 558
DSEL        1.      0.0       0.      0.0  150000.      0.0      0.     0.0    PTRN
RUNWAY    1000     1375     1346     1575      199      199    6.00          06
FLTTRK    3700        0     1500      -90     2000        0    1500    -90TKOF LHP 1
          6200        0     1500      -90     2000        0    1500    -90TKOF LHP 2
          2500        0                                                   TKOF LHP
FLIGHT     611        1              2.08      .09                        OH58 6 1
TODSCR     611        2        2        1     1500             6112   24562OH58PTRN *
          6116    25824                                                  OH58PTRN
ALTUDE       2        0        0        0       75      375    6056     375PTRN 558 *
          8056      650    18968      650    20968      375   23457     375PTRN 558 *
         25824        0    25824        0        0        0       0       0PTRN 558
FLIGHT     611        2             14.56      .63                        OH58 6 1
TODSCR     611        3        3        1     1500             6112   25078OH58PTRN *
          6116    25824                                                  OH58PTRN
ALTUDE       3        0        0        0       75      375    6056     375PTRN 558 *
          8056      650    18968      650    20968      375   24425     375PTRN 558 *
         25824        0    25824        0        0        0       0       0PTRN 558
FLIGHT     611        3              4.16      .18                        OH58 6 1
RUNWAY    1000     1259     1346     1459      199      199    6.00          06
FLTTRK    3700        0     1500      -90     2000        0    1500    -90TKOF LHP 1
          6200        0     1500      -90     2000        0    1500    -90TKOF LHP 2
          2500        0                                                   TKOF LHP
FLIGHT     611        1              2.08      .09                        OH58 6 2
FLIGHT     611        2             14.56      .63                        OH58 6 2
FLIGHT     611        3              4.16      .18                        OH58 6 2
RUNWAY    1000     1115     1346     1315      199      199    6.00          06
FLTTRK    3700        0     1500       90     2000        0    1500     90TKOF RHP 1
          6200        0     1500       90     2000        0    1500     90TKOF RHP 2
          2500        0                                                   TKOF RHP
FLIGHT     611        1              2.08      .09                        OH58 6 3
FLIGHT     611        2             14.56      .63                        OH58 6 3
FLIGHT     611        3              4.16      .18                        OH58 6 3
RUNWAY    1000     1000     1346     1200      199      199    6.00          06
FLTTRK    3700        0     1500       90     2000        0    1500     90TKOF RHP 1
          6200        0     1500       90     2000        0    1500     90TKOF RHP 2
          2500        0                                                   TKOF RHP
FLIGHT     611        1              2.08      .09                        OH58 6 4
FLIGHT     611        2             14.56      .63                        OH58 6 4
FLIGHT     611        3              4.16      .18                        OH58 6 4
TODSCR     611        4        4        1     1500              612   23922OH58PTRN *
          6116    25824                                                  OH58PTRN
```

```
ALTUDE       4        0        0        0       75      375     4856     375PTRN 558 *
          6856      650    17768      650    19768      375    22257     375PTRN 558 *
         25824        0    25824        0        0        0        0       0PTRN 558
RUNWAY    1346     1575     1000     1375      199      199     6.00          24
FLTTRK    2500        0     1500       90     2000        0     1500      90TKOF RHP 1
          6200        0     1500       90     2000        0     1500      90TKOF RHP 2
          3700        0                                                   TKOF RHP
FLIGHT     611        4              3.12      .11                        OH582410
TODSCR     611        5        5        1     1500             6112   24562OH58PTRN *
          6116    25824                                                   OH58PTRN
ALTUDE       5        0        0        0       75      375     4856     375PTRN 558 *
          6856      650    17768      650    19768      375    23457     375PTRN 558 *
         25824        0    25824        0        0        0        0       0PTRN 558
FLIGHT     611        5             21.84      .77                        OH582410
TODSCR     611        6        6        1     1500             6112   25078OH58PTRN *
          6116    25824                                                   OH58PTRN
ALTUDE       6        0        0        0       75      375     4856     375PTRN 558 *
          6856      650    17768      650    19768      375    24425     375PTRN 558 *
         25824        0    25824        0        0        0        0       0PTRN 55
FLIGHT     611        6              6.24      .22                        OH5824
RUNWAY    1346     1459     1000     1259      199      199     6.00          24
FLTTRK    2500        0     1500       90     2000        0     1500      90TKOF
          6200        0     1500       90     2000        0     1500      90TKOF     2
          3700        0                                                   TKOF
FLIGHT     611        4              3.12      .11                        OH5824
FLIGHT     611        5             21.84      .77                        OH5824
FLIGHT     611        6              6.24      .22                        OH582411
RUNWAY    1346     1315     1000     1115      199      199     6.00          24
FLTTRK    2500        0     1500      -90     2000        0     1500     -90TKOF LHP 1
          6200        0     1500      -90     2000        0     1500     -90TKOF LHP 2
          3700        0                                                   TKOF LHP
FLIGHT     611        4              3.12      .11                        OH582412
FLIGHT     611        5             21.84      .77                        OH582412
FLIGHT     611        6              6.24      .22                        OH582412
RUNWAY    1346     1200     1000     1000      199      199     6.00          24
FLTTRK    2500        0     1500      -90     2000        0     1500     -90TKOF LHP 1
          6200        0     1500      -90     2000        0     1500     -90TKOF LHP 2
          3700        0                                                   TKOF LHP
FLIGHT     611        4              3.12      .11                        OH582413
FLIGHT     611        5             21.84      .77                        OH582413
FLIGHT     611        6              6.24      .22                        OH582413
PLOT  2.      24000.  62.     66.      70.      74.
END
```

This is not quite ready to be used as NOISEMAP3.4 input. Remember the information on the DRIVER $RUNWY instructions was metric, but all other information was English. The only place the runway information is used (in a NOISEMAP3.4 instruction) is in the NOISEMAP3.4 RUNWAY instruction. In order to make NOISEMAP3.4 read this correctly, use NOISEMAP3.4 UNITS instructions to tell NOISEMAP3.4 which units to use. A UNITS instruction changing English to metric should be right before each RUNWAY instruction. A UNITS instruction changing back to English should be right after each RUNWAY instruction. For example, the first RUNWAY instruction should look like:

```
UNITS                                                                   METRIC
RUNWAY    1000     1375     1346     1575      199      199     6.00       06
UNITS                                                                   ENGLISH
```

The extra cards can be put in with any editor.

The whole file, when it is ready to be used as NOISEMAP3.4 input, looks like:

```
ALIGN 1.0
UNITS                                                                   METRIC
AIRFLD-6446.8 4983.2  -2522.355097.65                                   WEST
     EXAMPLE 2
PROCES
UNITS                                                                   ENGLISH
TODSCR     611        1        1        1     1500              6112   23922OH58PTRN *
          6116    25824                                                 OH58PTRN
ALTUDE       1        0        0        0       75      375     6056     375PTRN 558 *
          8056      650    18968      650    20968      375    23324     262PTRN 558 *
         23332      262    25824        0        0        0        0       0PTRN 558
DSEL        1.      0.0       0.      0.0  150000.      0.0       0.     0.0    PTRN
FLTTRK    3700        0     1500      -90     2000        0     1500     -90TKOF LHP 1
          6200        0     1500      -90     2000        0     1500     -90TKOF LHP 2
          2500        0                                                    TKOF LHP
FLIGHT     611        1              2.08      .09                         OH58 6 1
TODSCR     611        2        2        1     1500              6112   24562OH58PTRN *
          6116    25824                                                 OH58PTRN
ALTUDE       2        0        0        0       75      375     6056     375PTRN 558 *
          8056      650    18968      650    20968      375    23457     375PTRN 558 *
         25824        0    25824        0        0        0        0       0PTRN 558
FLIGHT     611        2             14.56      .63                         OH58 6 1
TODSCR     611        3        3        1     1500              6112   25078OH58PTRN *
          6116    25824                                                 OH58PTRN
ALTUDE       3        0        0        0       75      375     6056     375PTRN 558 *
          8056      650    18968      650    20968      375    24425     375PTRN 558 *
         25824        0    25824        0        0        0        0       0PTRN 558
FLIGHT     611        3              4.16      .18                         OH58 6 1
UNITS                                                                   METRIC
RUNWAY    1000     1259     1346     1459      199      199     6.00       06
UNITS                                                                   ENGLISH
FLTTRK    3700        0     1500      -90     2000        0     1500     -90TKOF LHP 1
          6200        0     1500      -90     2000        0     1500     -90TKOF LHP 2
          2500        0                                                    TKOF LHP
FLIGHT     611        1              2.08      .09                         OH58 6 2
FLIGHT     611        2             14.56      .63                         OH58 6 2
FLIGHT     611        3              4.16      .18                         OH58 6 2
UNITS                                                                   METRIC
RUNWAY    1000     1115     1346     1315      199      199     6.00       06
UNITS                                                                   ENGLISH
FLTTRK    3700        0     1500       90     2000        0     1500      90TKOF RHP 1
          6200        0     1500       90     2000        0     1500      90TKOF RHP 2
          2500        0                                                    TKOF RHP
```

FLIGHT	611	1		2.08	.09			OH58 6 3
FLIGHT	611	2		14.56	.63			OH58 6 3
FLIGHT	611	3		4.16	.18			OH58 6 3
UNITS								METRIC
RUNWAY	1000	1000	1346	1200	199	199	6.00	06
UNITS								ENGLISH
FLTTRK	3700	0	1500	90	2000	0	1500	90TKOF RHP 1
	6200	0	1500	90	2000	0	1500	90TKOF RHP 2
	2500	0						TKOF RHP
FLIGHT	611	1		2.08	.09			OH58 6 4
FLIGHT	611	2		14.56	.63			OH58 6 4
FLIGHT	611	3		4.16	.18			OH58 6 4
TODSCR	611	4	4	1	1500		6112	23922OH58PTRN *
	6116	25824						OH58PTRN
ALTUDE	4	0	0	0	75	375	4856	375PTRN 558 *
	6856	650	17768	650	19768	375	22257	375PTRN 558 *
	25824	0	25824	0	0	0	0	0PTRN 558
UNITS								METRIC
RUNWAY	1346	1575	1000	1375	199	199	6.00	24
UNITS								ENGLISH
FLTTRK	2500	0	1500	90	2000	0	1500	90TKOF RHP 1
	6200	0	1500	90	2000	0	1500	90TKOF RHP 2
	3700	0						TKOF RHP
FLIGHT	611	4		3.12	.11			OH582410
TODSCR	611	5	5	1	1500		6112	24562OH58PTRN *
	6116	25824						OH58PTRN
ALTUDE	5	0	0	0	75	375	4856	375PTRN 558 *
	6856	650	17768	650	19768	375	23457	375PTRN 558 *
	25824	0	25824	0	0	0	0	0PTRN 558
FLIGHT	611	5		21.84	.77			OH582410
TODSCR	611	6	6	1	1500		6112	25078OH58PTRN *
	6116	25824						OH58PTRN
ALTUDE	6	0	0	0	75	375	4856	375PTRN 558 *
	6856	650	17768	650	19768	375	24425	375PTRN 558 *
	25824	0	25824	0	0	0	0	0PTRN 558
FLIGHT	611	6		6.24	.22			OH582410
UNITS								METRIC
RUNWAY	1346	1459	1000	1259	199	199	6.00	24
UNITS								ENGLISH
FLTTRK	2500	0	1500	90	2000	0	1500	90TKOF RHP 1
	6200	0	1500	90	2000	0	1500	90TKOF RHP 2
	3700	0						TKOF RHP
FLIGHT	611	4		3.12	.11			OH582411
FLIGHT	611	5		21.84	.77			OH582411
FLIGHT	611	6		6.24	.22			OH582411
UNITS								METRIC
RUNWAY	1346	1315	1000	1115	199	199	6.00	24
UNITS								ENGLISH
FLTTRK	2500	0	1500	-90	2000	0	1500	-90TKOF LHP 1
	6200	0	1500	-90	2000	0	1500	-90TKOF LHP 2
	3700	0						TKOF LHP
FLIGHT	611	4		3.12	.11			OH582412
FLIGHT	611	5		21.84	.77			OH582412
FLIGHT	611	6		6.24	.22			OH582412

```
UNITS                                                                             METRIC
RUNWAY   1346     1200     1000     1000      199      199     6.00                 24
UNITS                                                                            ENGLISH
FLTTRK   2500        0     1500      -90     2000        0     1500         -90TKOF LHP 1
         6200        0     1500      -90     2000        0     1500         -90TKOF LHP 2
         3700        0                                                         TKOF LHP
FLIGHT    611        4              3.12      .11                              OH582413
FLIGHT    611        5             21.84      .77                              OH582413
FLIGHT    611        6              6.24      .22                              OH582413
PLOT  2.      24000.  62.      66.      70.      74.
END
```

To use the above file, the user must use the following JCL file to put the SEL and AL profiles in (in the right place). When using the following JCL, the user should put a card with "*WEOR" at the left in the NOISEMAP3.4 input where the SEl and AL profiles should go.

```
NAME,Ttime,CMspace,P02.
USER,usernum,password.
GET,LGO=NSMAPB,DATA=name-of-noisemap-input-file,UH1H,CH47.
COMMENT. uh1h,ch47 are the SEL and AL profiles for those helicopters
COPYBR,DATA,INPUT.  1st part to noisemap input
COPYBF,UH1H,INPUT.  sel and al for uh1h
COPYBF,CH47,INPUT.  sel and al for ch47
COPYBF,DATA,INPUT.  rest of noisemap input
PACK,INPUT.  makes it one file instead of several back to back
REWIND,INPUT.
COPYSBF,INPUT,output.  get copy of the input on the noisemap output
REWIND,INPUT.
LGO,INPUT.  runs noisemap on the input
FILES.  gives list of all local files--may be useful if problems in run
REPLACE,OUTPUT=output-file-name.  saves output file
GET,output-file-name.
COPYBF,output-file-name,OUTPUT,10.  gets copy of output
REPLACE,TAPE11=PLOT-FILE-NAME. if PLOT used only--saves plot file
EXIT,U.  comes here if there is an error above it
COST,LO=F.  puts accounting information to output
DAYFILE,L=dayfile-name.  gets dayfile--list of times when computer
COMMENT. executed instructions in the jcl
REPLACE,dayfile-name.  saves dayfile
```

Everything following a period (on a line) is a comment to explain what the command does. It does not have to be copied when the user creates her/his own JCL. Everything ending in "-name" shows where the user should put in a name of his/her choosing. The names should be one to seven letters or numbers long. The first character must be a letter, but the other six characters may be any letter or any digit.

APPENDIX:

NOISE INFORMATION IN NOISEMAP3.4 FORMAT FOR SEVERAL
HELICOPTERS (AH1G, UH1H, UH60, CH47, TH55, OH58, S76)

```
COMMENT   UH-60 SEL CURVES BASED ON FAA DATA
COMMENT  5231  UH-60 FLYOVER  FAA DATA
SEL    5231.   1.      88.0    87.0    86.0    84.9    83.9    82.9    UH60FO F 1
       81.7    80.6    79.5    78.1    76.8    75.2    73.3    71.0    UH60FO F 2
       69.4    66.7    64.4    62.4    60.5    58.2    56.0    53.5    UH60FO F 3
       5231.   2.      93.0    92.0    91.0    89.9    89.0    88.0    UH60FO F 4
       86.9    86.0    85.0    83.9    83.0    82.0    81.0    79.9    UH60FO F 5
       79.0    78.0    76.9    76.0    75.0    73.9    73.0    72.0    UH60FO F
COMMENT  5232   UH-60 FLYOVER WITH IMPULSIVENESS CORRECTION   FAA DATA
SEL    5232.   1.      93.0    92.0    91.0    89.9    88.8    87.4    UH60FO F 1
       85.7    84.0    82.0    79.6    77.1    75.2    73.3    71.0    UH60FO F 2
       69.4    66.7    64.4    62.4    60.5    58.2    56.0    53.5    UH60FO F 3
       5232.   2.      98.0    97.0    96.0    94.9    93.9    92.5    UH60FO F 4
       90.9    89.4    87.5    85.4    83.3    82.0    81.0    79.9    UH60FO F 5
       79.0    78.0    76.9    76.0    75.0    73.9    73.0    72.0    UH60FO F
COMMENT   5233    UH-60 TAKEOFF       FAA DATA
SEL    5233.   1.      80.6    79.7    78.7    77.6    76.6    75.6    UH60TO F 1
       74.4    73.2    72.2    70.8    69.4    67.9    66.0    63.7    UH60TO F 2
       62.1    59.4    57.1    55.0    53.2    50.9    48.6    46.2    UH60TO F 3
       5233.   2.      85.6    84.7    83.7    82.6    81.7    80.7    UH60TO F 4
       79.6    78.6    77.7    76.6    75.6    74.7    73.7    72.6    UH60TO F 5
       71.7    70.7    69.6    68.6    67.7    66.6    65.6    64.7    UH60TO F
COMMENT   5235  UH-60 LANDING       FAA DATA
SEL    5235.   1.      83.6    82.6    81.6    80.6    79.5    78.5    UH60LA F 1
       77.3    76.2    75.1    73.7    72.4    70.8    68.9    66.7    UH60LA F 2
       65.0    62.3    60.0    58.0    56.1    53.8    51.6    49.1    UH60LA F 3
       5235.   2.      88.6    87.6    86.6    85.6    84.6    83.6    UH60LA F 4
       82.5    81.6    80.6    79.5    78.6    77.6    76.6    75.6    UH60LA F 5
       74.6    73.6    72.5    71.6    70.6    69.5    68.6    67.6    UH60LA F
COMMENT  5236  UH-60 LANDING WITH IMPULSIVENESS CORRECTION     FAA DATA
SEL    5236.   1.      88.6    87.6    86.6    85.6    84.4    83.0    UH60LA F 1
       81.3    79.6    77.6    75.2    72.7    70.8    68.9    66.7    UH60LA F 2
       65.0    62.3    60.0    58.0    56.1    53.8    51.6    49.1    UH60LA F 3
       5236.   2.      93.6    92.6    91.6    90.6    89.5    88.1    UH60LA F 4
       86.5    85.0    83.1    81.0    78.9    77.6    76.6    75.6    UH60LA F 5
       74.6    73.6    72.5    71.6    70.6    69.5    68.6    67.6    UH60LA F
COMMENT 6301  FLYOVER  S-76
SEL    6301.   1.      80.3    79.3    78.3    77.3    76.2    75.2    S-76 FO  1
       74.0    72.9    71.8    70.4    69.1    67.5    65.6    63.4    S-76 FO  2
       61.7    59.0    56.7    54.7    52.8    50.5    48.3    45.8    S-76 FO  3
       6301.   2.      85.3    84.3    83.3    82.3    81.3    80.3    S-76 FO  4
       79.2    78.3    77.3    76.2    75.3    74.3    73.3    72.3    S-76 FO  5
       71.3    70.3    69.2    68.3    67.3    66.2    65.3    64.3    S-76 FO
COMMENT  6302   FLYOVER WITH IMPULSIVENESS CORRECTION    S-76
SEL    6302.   1.      85.3    84.3    83.3    82.3    81.1    79.7    S-76 FO  1
       78.0    76.3    74.3    71.9    69.4    67.5    65.6    63.4    S-76 FO  2
       61.7    59.0    56.7    54.7    52.8    50.5    48.3    45.8    S-76 FO  3
       6302.   2.      90.3    89.3    88.3    87.3    86.2    84.8    S-76 FO  4
```

```
        83.2    81.7    79.8    77.7    75.6    74.3    73.3    72.3    S-76 FO  5
        71.3    70.3    69.2    68.3    67.3    66.2    65.3    64.3    S-76 FO
COMMENT 6303   TAKEOFF   S-76
SEL     6303.   1.      81.9    81.0    80.0    78.9    77.9    76.9    S-76 TO  1
        75.7    74.6    73.5    72.1    70.7    69.2    67.3    65.0    S-76 TO 2
        63.4    60.7    58.4    56.4    54.5    52.2    49.9    47.5    S-76 TO  3
        6303.   2.      86.9    86.0    85.0    83.9    83.0    82.0    S-76 TO  4
        80.9    80.0    79.0    77.9    76.9    76.0    75.0    73.9    S-76 TO  5
        73.0    72.0    70.9    70.0    69.0    67.9    66.9    66.0    S-76 TO
COMMENT  6305    APPROACH  S-76
SEL     6305.   1.      82.4    81.4    80.4    79.4    78.3    77.3    S-76LAND 1
        76.2    75.0    73.9    72.6    71.2    69.6    67.7    65.5    S-76LAND 2
        63.8    61.1    58.9    56.8    54.9    52.7    50.4    47.9    S-76LAND 3
        6305.   2.      87.4    86.4    85.4    84.4    83.4    82.4    S-76LAND 4
        81.4    80.4    79.4    78.4    77.4    76.4    75.4    74.4    S-76LAND 5
        73.4    72.4    71.4    70.4    69.4    68.4    67.4    66.4    S-76LAND
COMMENT  6306  APPROACH WITH IMPULSIVENESS CORRECTION  S-76
SEL     6306.   1.      87.4    86.4    85.4    84.4    83.2    81.9    S-76LAND 1
        80.2    78.4    76.4    74.1    71.5    69.6    67.7    65.5    S-76LAND 2
        63.8    61.1    58.9    56.8    54.9    52.7    50.4    47.9    S-76LAND 3
        6306.   2.      92.4    91.4    90.4    89.4    88.3    86.9    S-76LAND 4
        85.4    83.8    81.9    79.9    77.7    76.4    75.4    74.4    S-76LAND 5
        73.4    72.4    71.4    70.4    69.4    68.4    67.4    66.4    S-76LAND
COMMENT  6231--TAKEOFF FLYOVER--UH-60
SEL     6231    1       85.7    85.1    84.4    83.6    82.9    82.1    UH60 TO  1
        81.3    78.9    77.8    76.4    75.1    73.5    71.6    69.4    UH60 TO  2
        67.7    65.0    62.7    60.7    58.8    56.5    54.3    51.8    UH60 TO  3
        6231    2       90.7    90.1    89.4    88.6    88.0    87.2    UH60 TO  4
        86.5    84.3    83.3    82.2    81.3    80.3    79.3    78.3    UH60 TO  5
        77.3    76.3    75.2    74.3    73.3    72.2    71.3    70.3    UH60 TO
COMMENT  6232--FLYOVER WITH IMPULSIVENESS CORRECTION--UH-60
SEL     6232    1       90.7    90.1    89.3    88.1    86.9    85.5    UH60 FO  1
        83.8    80.4    78.1    76.4    75.1    73.5    71.6    69.4    UH60 FO  2
        67.7    65.0    62.7    60.7    58.8    56.5    54.3    51.8    UH60 FO  3
        6232    2       95.7    95.1    94.3    93.1    92.0    90.6    UH60 FO  4
        89.0    85.8    83.6    82.2    81.3    80.3    79.3    78.3    UH60 FO  5
        77.3    76.3    75.2    74.3    73.3    72.2    71.3    70.3    UH60 FO
COMMENT  6235--APPROACH--UH60
SEL     6235    1       97.3    96.7    96.0    95.2    94.5    93.7    UH60LAND 1
        92.9    90.5    89.4    88.0    86.7    85.1    83.2    81.0    UH60LAND 2
        79.3    76.6    74.3    72.3    70.4    68.1    65.9    63.4    UH60LAND 3
        6235    2       102.3   101.7   101.0   100.2   99.6    98.8    UH60LAND 4
        98.1    95.9    94.9    93.8    92.9    91.9    90.9    89.9    UH60LAND 5
        88.9    87.9    86.8    85.9    84.9    83.8    82.9    81.9    UH60LAND
COMMENT  6236--APPROACH WITH IMPULSIVENESS CORRECTION--UH-60
SEL     6236    1       102.3   101.7   100.9   99.7    98.5    97.1    UH60LAND 1
        95.4    92.0    89.7    88.0    86.7    85.1    83.2    81.0    UH60LAND 2
        79.3    76.6    74.3    72.3    70.4    68.1    65.9    63.4    UH60LAND 3
        6236    2       [illegible].3   106.7   105.9   104.7   103.6   102.2   UH60LAND 4
        100.6   97[illegible]   [illegible]   93.9    92.9    91.9    90.9    89.9    UH60LAND 5
        88.9    8[illegible]    [illegible]   85.9    84.9    83.8    82.9    81.9    UH60LAND
COMMENT 6111 - TA[illegible]ER - OH-58
SEL     6111.   1.      [illegible]   85.1    83.7    82.3    80.8    79.3    OH58 TO  1
        77.6    76.1    74.6    72.9    71.3    69.3    67.1    64.4    OH58 TO  2
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        61.4     58.2     55.1     52.0     48.9     44.6     40.4     35.5     OH58TO  3
        6111.    2.       91.5     90.1     88.7     87.3     85.8     84.4     OH58 TO  4
        82.7     81.4     80.0     78.4     77.0     75.5     74.0     72.2     OH58 TO  5
        70.3     68.3     66.1     63.9     61.7     58.6     55.6     52.3     OH58 TO
COMMENT 6112 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6112 - HELICOPTER OH-58
SEL     6112.    1.       91.5     90.1     88.7     87.3     85.8     84.3     OH58 FO  1
        82.6     81.0     79.2     77.0     74.7     72.0     68.8     64.7     OH58 FO  2
        61.4     58.2     55.1     52.0     48.9     44.6     40.4     35.5     OH58 FO  3
        6112.    2.       96.5     95.1     93.7     92.3     90.8     89.4     OH58 FO  4
        87.7     86.3     84.6     82.5     80.4     78.2     75.7     72.5     OH58 FO  5
        70.3     68.3     66.1     63.9     61.7     58.6     55.6     52.3     OH58 FO
COMMENT 6115 - APPROACH - OH-58
SEL     6115.    1.       92.7     91.3     89.8     88.3     86.7     85.0     OH58LAND 1
        83.1     81.5     79.9     78.1     76.4     74.3     71.9     69.1     OH58LAND 2
        65.9     62.5     59.3     56.1     52.9     48.5     44.3     39.2     OH58LAND 3
        6115.    2.       97.7     96.3     94.8     93.3     91.7     90.1     OH58LAND 4
        88.2     86.8     85.3     83.6     82.1     80.5     78.8     76.9     OH58LAND 5
        74.8     72.6     70.3     68.0     65.7     62.5     59.5     56.0     OH58LAND
COMMENT 6116 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6116 - HELICOPTER - OH-58
SEL     6116.    1.       97.7     96.3     94.8     93.3     91.7     90.0     OH58LAND 1
        88.1     86.4     84.5     82.2     79.8     77.0     73.6     69.4     OH58LAND 2
        65.9     62.5     59.3     56.1     52.9     48.5     44.3     39.2     OH58LAND 3
        6116.    2.       102.7    101.3    99.8     98.3     96.7     95.1     OH58LAND 4
        93.2     91.7     89.9     87.7     85.5     83.2     80.5     77.2     OH58LAND 5
        74.8     72.6     70.3     68.0     65.7     62.5     59.5     56.0     OH58LAND
COMMENT 6121 - TAKEOFF,FLYOVER - AH-1G
SEL     6121.    1.       93.4     92.0     90.5     89.0     87.5     86.0     AH1G TO  1
        84.3     83.0     81.2     79.6     78.0     76.0     73.6     71.0     AH1G TO  2
        67.8     64.4     61.5     58.3     55.0     50.8     46.1     41.2     AH1G TO  3
        6121.    2.       98.4     97.0     95.5     94.0     92.6     91.1     AH1G TO  4
        89.5     88.2     86.7     85.3     83.9     82.4     80.7     79.0     AH1G TO  5
        77.2     75.2     72.9     70.6     68.3     65.5     62.4     59.4     AH1G TO
COMMENT 6122 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6122 - HELICOPTER AH-1G
SEL     6122.    1.       98.4     97.0     95.5     94.0     92.5     91.0     AH1G FO  1
        89.3     87.9     85.8     83.7     81.4     78.7     75.3     71.3     AH1G FO  2
        67.8     64.4     61.5     58.3     55.0     50.8     46.1     41.2     AH1G FO  3
        6122.    2.       103.4    102.0    100.5    99.0     97.6     96.1     AH1G FO  4
        94.5     93.1     91.3     89.4     87.3     85.1     82.4     79.3     AH1G FO  5
        77.2     75.2     72.9     70.6     68.3     65.5     62.4     59.4     AH1G FO
COMMENT 6125 - APPROACH - AH-1G
SEL     6125.    1.       99.6     98.2     96.6     95.0     93.4     91.7     AH1GLAND 1
        89.8     88.4     86.5     84.8     83.1     81.0     78.4     75.7     AH1GLAND 2
        72.3     69.0     65.7     62.4     59.0     54.7     50.0     44.9     AH1GLAND 3
        6125.    2.       104.6    103.2    101.6    100.0    98.5     96.8     AH1GLAND 4
        95.0     93.6     92.0     90.5     89.0     87.4     85.5     83.7     AH1GLAND 5
        81.7     79.5     77.1     74.7     72.3     69.4     66.3     63.1     AH1GLAND
COMMENT 6126 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6126 - HELICOPTER - AH-1G
SEL     6126.    1.       104.6    103.2    101.6    100.0    98.4     96.7     AH1GLAND 1
        94.8     93.3     91.1     88.9     86.5     83.7     80.1     76.0     AH1GLAND 2
        72.3     69.0     65.7     62.4     59.0     54.7     50.0     44.9     AH1GLAND 3
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        6126.   2.      109.6   108.2   106.6   105.0   103.5   101.8   AH1GLAND 4
        100.0   98.5    96.6    94.6    92.4    90.1    87.2    84.0    AH1GLAND 5
        81.7    79.5    77.1    74.7    72.3    69.4    66.3    63.1    AH1GLAND
COMMENT 6241 - TAKEOFF,FLYOVER - UH-1H
SEL     6241.   1.      93.7    92.5    91.0    89.6    88.1    86.7    UH1H TO  1
        84.9    83.5    82.0    80.2    79.3    76.1    73.7    70.5    UH1H TO  2
        67.6    64.5    61.0    58.0    54.8    51.1    47.3    43.2    UH1H TO  3
        6241.   2.      98.7    97.5    96.0    94.6    93.2    91.9    UH1H TO  4
        90.3    89.0    87.7    86.4    85.0    83.6    82.3    80.6    UH1H TO  5
        79.0    77.1    75.1    73.3    71.1    68.5    66.1    63.4    UH1H TO
COMMENT 6242 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6242 - HELICOPTER UH-1H
SEL     6242.   1.      98.7    97.5    96.0    94.6    93.1    91.7    UH1H FO  1
        89.9    88.4    86.6    84.3    81.7    78.8    75.4    70.8    UH1H FO  2
        67.6    64.5    61.0    58.0    54.8    51.1    47.3    43.2    UH1H FO  3
        6242.   2.      103.7   102.5   101.0   99.6    98.2    96.9    UH1H FO  4
        95.3    93.9    92.3    90.5    88.4    86.3    84.0    80.9    UH1H FO  5
        79.0    77.1    75.1    73.3    71.1    68.5    66.1    63.4    UH1H FO
COMMENT 6245 - APPROACH - UH-1H
SEL     6245.   1.      99.9    98.7    97.1    95.6    94.0    92.4    UH1HLAND 1
        90.6    88.9    87.3    85.4    83.4    81.1    78.5    75.2    UH1HLAND 2
        72.1    68.8    65.2    62.1    58.8    55.0    51.2    46.9    UH1HLAND 3
        6245.   2.      104.9   103.7   102.1   100.6   99.1    97.6    UH1HLAND 4
        96.0    94.4    93.0    91.6    90.1    88.6    87.1    85.3    UH1HLAND 5
        83.5    81.4    79.3    77.4    75.1    72.4    70.0    67.1    UH1HLAND
COMMENT 6246 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6246 - HELICOPTER - UH-1H
SEL     6246.   1.      104.9   103.7   102.1   100.6   99.0    97.4    UH1HLAND 1
        95.6    93.8    91.9    89.5    86.8    83.8    80.2    75.5    UH1HLAND 2
        72.1    68.8    65.2    62.1    58.8    55.0    51.2    46.9    UH1HLAND 3
        6246.   2.      109.9   108.7   107.1   105.6   104.1   102.6   UH1HLAND 4
        101.0   99.3    97.6    95.7    93.5    91.3    88.8    85.6    UH1HLAND 5
        83.5    81.4    79.3    77.4    75.1    72.4    70.0    67.1    UH1HLAND
COMMENT 6071 - TAKEOFF,FLYOVER - CH-47
SEL     6071.   1.      96.1    94.6    93.3    91.9    90.5    88.9    CH47 TO  1
        87.3    85.8    84.2    82.3    80.4    78.2    75.8    73.1    CH47 TO  2
        70.1    67.0    63.5    60.3    56.6    52.5    48.6    44.7    CH47 TO  3
        6071.   2.      101.1   99.6    98.3    96.9    95.7    94.2    CH47 TO  4
        92.9    91.7    90.5    89.2    87.9    86.6    85.2    83.7    CH47 TO  5
        82.3    80.5    78.8    77.1    75.1    72.7    70.4    67.8    CH47 TO
COMMENT 6072 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6072 - HELICOPTER CH-47
SEL     6072.   1.      101.1   99.6    98.3    96.9    95.5    93.9    CH47 FO  1
        92.3    90.7    88.8    86.4    83.8    80.9    77.5    73.4    CH47 FO  2
        70.1    67.0    63.5    60.3    56.6    52.5    48.6    44.7    CH47 FO  3
        6072.   2.      106.1   104.6   103.3   101.9   100.7   99.2    CH47 FO  4
        97.9    96.6    95.1    93.3    91.3    89.3    86.9    84.0    CH47 FO  5
        82.3    80.5    78.8    77.1    75.1    72.7    70.4    67.8    CH47 FO
COMMENT 6075 - APPROACH - CH-47
SEL     6075.   1.      102.3   100.8   99.4    97.9    96.4    94.6    CH47LAND 1
        92.8    91.2    89.5    87.5    85.5    83.2    80.6    77.8    CH47LAND 2
        74.6    71.3    67.7    64.4    60.6    56.4    52.5    48.4    CH47LAND 3
        6075.   2.      107.3   105.8   104.4   102.9   101.6   99.9    CH47LAND 4
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         98.4    97.1    95.8    94.4    93.0    91.6    90.0    88.4    CH47LAND 5
         86.8    84.8    83.0    81.2    79.1    76.6    74.3    71.5    CH47LAND
COMMENT 6076 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6076 - HELICOPTER - CH-47
SEL      6076.   1.      107.3   105.8   104.4   102.9   101.4   99.6    CH47LAND 1
         97.8    96.1    94.1    91.6    88.9    85.9    82.3    78.1    CH47LAND 2
         74.6    71.3    67.7    64.4    60.6    56.4    52.5    48.4    CH47LAND 3
         6076.   2.      112.3   110.8   109.4   107.9   106.6   104.9   CH47LAND 4
         103.4   102.0   100.4   98.5    96.4    94.3    91.7    88.7    CH47LAND 5
         86.8    84.8    83.0    81.2    79.1    76.6    74.3    71.5    CH47LAND
COMMENT 6091 - TAKEOFF,FLYOVER - TH-55
SEL      6091.   1.      88.0    86.6    85.1    83.6    82.1    80.2    TH55 TO  1
         78.6    77.0    75.2    73.3    71.4    69.2    66.6    63.5    TH55 TO  2
         60.2    56.8    53.1    49.7    45.9    41.4    36.8    31.8    TH55 TO  3
         6091.   2.      93.0    91.6    90.1    88.6    87.1    85.3    TH55 TO  4
         83.7    82.1    80.6    79.0    77.3    75.6    73.7    71.6    TH55 TO  5
         69.5    67.2    64.8    62.5    60.0    57.0    54.1    50.9    TH55 TO
COMMENT 6092 - FLYOVER WITH IMPULSIVENESS CORRECTION
COMMENT 6092 - HELICOPTER TH-55
SEL      6092.   1.      93.0    91.6    90.1    88.6    87.1    85.2    TH55 FO  1
         83.6    81.9    79.8    77.4    74.8    71.9    68.3    63.8    TH55 FO  2
         60.2    56.8    53.1    49.7    45.9    41.4    36.8    31.8    TH55 FO  3
         6092.   2.      98.0    96.6    95.1    93.6    92.1    90.3    TH55 FO  4
         88.7    87.0    85.2    83.1    80.7    78.3    75.4    71.9    TH55 FO  5
         69.5    67.2    64.8    62.5    60.0    57.0    54.1    50.9    TH55 FO
COMMENT 6095 - APPROACH - TH-55
SEL      6095.   1.      94.2    92.8    91.2    89.6    88.0    85.9    TH55LAND 1
         84.1    82.4    80.5    78.4    76.5    74.2    71.4    68.2    TH55LAND 2
         64.7    61.1    57.3    53.8    49.9    45.3    40.7    35.5    TH55LAND 3
         6095.   2.      99.2    97.8    96.2    94.6    93.0    91.0    TH55LAND 4
         89.2    87.5    85.9    84.1    82.4    80.6    78.5    76.3    TH55LAND 5
         74.0    71.5    69.0    66.6    64.0    60.9    58.0    54.6    TH55LAND
COMMENT 6096 - APPROACH WITH IMPULSIVENESS CORRECTION
COMMENT 6096 - HELICOPTER - TH-55
SEL      6096.   1.      99.2    97.8    96.2    94.6    93.0    90.9    TH55LAND 1
         89.1    87.3    85.1    82.5    79.9    76.9    73.1    68.5    TH55LAND 2
         64.7    61.1    57.3    53.8    49.9    45.3    40.7    35.5    TH55LAND 3
         6096.   2.      104.2   102.8   101.2   99.6    98.0    96.0    TH55LAND 4
         94.2    92.4    90.5    88.2    85.8    83.3    80.2    76.6    TH55LAND 5
         74.0    71.5    69.0    66.6    64.0    60.9    58.0    54.6    TH55LAND
COMMENT 611009 HOVER-IN-GROUND EFFECT
COMMENT 611009 HELICOPTER - OH-58
AL         611009      083.2     81.2    79.1    77.0    74.8    72.6    OH58  IN 1
         70.4    68.1    65.6    63.1    60.5    57.6    54.5    50.9    OH58  IN 2
         46.8    42.4    38.7    34.6    30.2    25.3    19.8    13.5    OH58  IN 3
           611009     3083.6     81.6    79.5    77.4    75.2    73.0    OH58  IN 4
         70.8    68.5    66.0    63.5    60.9    58.0    54.9    51.3    OH58  IN 5
         47.2    42.8    39.1    35.0    30.6    25.7    20.2    14.3    OH58  IN 6
           611009     6083.8     81.8    79.7    77.6    75.4    73.2    OH58  IN 7
         71.0    68.7    66.2    63.7    61.1    58.2    55.1    51.5    OH58  IN 8
         47.4    43.0    39.3    35.2    30.8    25.9    20.4    14.5    OH58  IN 9
           611009     9088.1     86.1    83.0    81.9    79.7    77.5    OH58  IN10
         75.3    73.0    70.5    68.0    65.4    62.5    59.4    55.8    OH58  IN11
         51.7    47.3    43.6    39.5    35.1    30.2    24.7    18.8    OH58  IN12
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         611009     12087.1     85.1      83.0      80.9      78.7      76.5      OH58   IN13
       74.3      72.0      69.5     67.0      64.4      61.5      58.4      54.8      OH58   IN14
       50.7      46.3      42.6     38.5      34.1      29.2      23.7      17.8      OH58   IN15
         611009     15087.4     85.4      83.3      82.0      79.0      76.8      OH58   IN16
       74.6      72.3      69.8     67.3      64.7      61.8      58.7      55.1      OH58   IN17
       51.0      46.6      42.9     38.8      34.4      29.5      24.0      18.1      OH58   IN18
         611009     18088.1     86.1      83.6      81.9      79.7      77.5      OH58   IN19
       75.3      73.0      70.5     68.0      65.4      62.5      59.4      55.8      OH58   IN20
       51.7      47.3      43.6     39.5      35.1      30.2      24.7      18.8      OH58   IN
COMMENT 612009 HOVER-IN-GROUND EFFECT
COMMENT 612009 HELICOPTER - AH-1G
AL       612009       093.8     91.8      89.7      87.6      85.5      83.2      AH1G   IN 1
       81.0      78.7      76.2     73.7      71.1      68.2      65.1      61.5      AH1G   IN 2
       57.4      53.1      49.4     45.3      40.9      36.0      30.6      24.6      AH1G   IN 3
         612009      3093.8     91.8      89.7      87.6      85.5      83.2      AH1G   IN 4
       81.0      78.7      76.2     73.7      71.1      68.2      65.1      61.5      AH1G   IN 5
       57.4      53.1      49.4     45.3      40.9      36.0      30.6      24.6      AH1G   IN 6
         612009      6092.7     90.7      88.6      86.5      84.4      82.1      AH1G   IN 7
       79.9      77.6      75.1     72.6      70.0      67.1      65.0      60.4      AH1G   IN 8
       56.3      52.0      48.3     44.2      39.8      34.9      29.5      23.5      AH1G   IN 9
         612009      9093.3     91.3      89.2      87.1      85.0      82.7      AH1G   IN10
       80.5      78.2      75.7     73.2      70.6      67.7      64.6      61.0      AH1G   IN11
       56.9      52.6      48.9     44.8      40.4      35.5      30.1      24.1      AH1G   IN12
         612009     12092.7     90.7      88.6      86.5      84.4      82.1      AH1G   IN13
       79.9      77.6      75.1     72.6      70.0      67.1      65.0      60.4      AH1G   IN14
       56.3      52.0      48.3     44.2      39.8      34.9      29.5      23.5      AH1G   IN15
         612009     15093.8     91.8      89.7      87.6      85.5      83.2      AH1G   IN16
       81.0      78.7      76.2     73.7      71.1      68.2      65.1      61.5      AH1G   IN17
       57.4      53.1      49.4     45.3      40.9      36.0      30.6      24.6      AH1G   IN18
         612009     18093.3     91.3      89.2      87.1      85.0      82.7      AH1G   IN19
       80.5      78.2      75.7     73.2      70.6      67.7      64.6      61.0      AH1G   IN20
       56.9      52.6      48.9     44.8      40.4      35.5      30.1      24.1      AH1G   IN
COMMENT 624009 HOVER-IN-GROUND EFFECT
COMMENT 624009 HELICOPTER - UH-1H
AL       624009       091.0     88.9      86.9      84.8      82.6      80.4      UH1H   IN 1
       78.2      75.8      73.4     70.8      68.1      65.1      61.8      58.1      UH1H   IN 2
       53.9      49.5      45.8     41.8      37.4      32.7      27.5      22.1      UH1H   IN 3
         624009      3089.8     87.7      85.7      83.6      81.4      79.2      UH1H   IN 4
       77.0      74.6      72.2     69.6      66.9      63.9      60.6      56.9      UH1H   IN 5
       52.7      48.3      44.6     40.6      36.2      31.5      26.3      20.9      UH1H   IN 6
         624009      6091.3     89.2      87.2      85.1      82.9      80.7      UH1H   IN 7
       78.5      76.1      73.7     71.1      68.4      65.4      62.1      58.4      UH1H   IN 8
       54.2      49.8      46.1     42.1      37.7      33.0      27.8      22.4      UH1H   IN 9
         624009      9090.7     88.6      86.6      84.5      82.3      80.1      UH1H   IN10
       77.9      75.5      73.1     70.5      67.8      64.9      61.5      57.8      UH1H   IN11
       53.6      49.2      45.5     41.5      37.1      32.4      27.2      21.8      UH1H   IN12
         624009     12093.0     90.9      88.9      86.8      84.6      82.4      UH1H   IN13
       80.2      77.8      75.4     72.8      70.1      67.2      63.8      60.1      UH1H   IN14
       55.9      51.5      47.8     43.8      37.4      34.7      29.5      23.1      UH1H   IN15
         624009     15096.8     94.7      92.7      90.6      88.4      86.2      UH1H   IN16
       84.0      81.6      79.2     76.6      73.9      71.0      67.6      63.9      UH1H   IN17
       59.7      55.3      51.6     47.6      43.2      38.5      33.3      27.9      UH1H   IN18
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          624009      18096.5     94.4      92.4      90.3      88.1      85.9      UH1H   IN19
        83.7      81.3      79.0      76.3      73.6      70.7      67.3      63.6      UH1H   IN20
        59.4      55.0      51.3      47.3      42.9      38.2      33.0      27.6      UH1H   IN

COMMENT 607009 HOVER-IN-GROUND EFFECT
COMMENT 607009 HELICOPTER - CH-47
AL        607009        0100.9     98.9      96.8      94.7      92.5      90.2      CH47   IN 1
        87.9      85.5      82.9      80.2      77.4      74.3      70.9      67.1      CH47   IN 2
        62.9      58.5      54.7      50.7      46.4      41.7      36.7      31.5      CH47   IN 3
          607009       30100.6     98.6      96.5      94.4      92.2      89.9      CH47   IN 4
        87.6      85.2      82.6      79.9      77.1      74.0      70.6      66.8      CH47   IN 5
        62.6      58.2      54.4      50.4      46.1      41.4      36.4      31.2      CH47   IN 6
          607009       60100.6     98.6      96.5      94.4      92.2      89.9      CH47   IN 7
        87.6      85.2      83.6      79.9      77.1      74.0      70.6      66.8      CH47   IN 8
        62.6      58.2      54.4      50.4      46.1      41.4      36.4      31.2      CH47   IN 9
          607009        9098.1     96.1      94.0      91.9      89.7      87.4      CH47   IN10
        85.1      82.7      80.1      77.4      74.6      71.5      68.1      64.3      CH47   IN11
        60.1      55.7      51.9      47.9      43.6      38.9      33.9      28.7      CH47   IN12
          607009      12098.9     96.9      94.8      92.7      90.5      88.2      CH47   IN13
        85.9      83.5      80.9      78.2      75.4      72.3      68.9      65.1      CH47   IN14
        60.9      56.5      52.7      48.7      44.4      39.7      34.7      29.5      CH47   IN15
          607009      15097.9     95.9      93.8      91.7      89.5      87.2      CH47   IN16
        84.9      82.5      79.9      77.2      73.4      70.3      67.9      64.1      CH47   IN17
        59.9      55.5      51.7      47.7      43.4      38.7      33.7      28.5      CH47   IN18
          607009      18094.2     92.2      90.1      88.0      85.8      83.5      CH47   IN19
        81.3      78.8      76.2      73.5      70.7      67.6      64.2      60.4      CH47   IN20
        56.2      51.8      48.0      44.0      39.7      35.0      30.0      24.8      CH47   IN
COMMENT 609009 HELICOPTER - TH-55
COMMENT 609009 HOVER-IN-GROUND EFFECT
AL        609009         083.1     81.0      78.8      76.7      74.4      72.2      TH55   IN 1
        69.8      67.4      64.8      62.1      59.4      56.3      53.0      49.3      TH55   IN 2
        45.2      40.8      36.8      32.4      27.8      22.7      17.3      11.6      TH55   IN 3
          609009        3085.1     83.0      80.8      78.7      76.4      74.2      TH55   IN 4
        71.8      69.4      66.8      64.1      61.4      58.3      55.0      51.3      TH55   IN 5
        47.2      42.8      38.8      34.4      29.8      24.7      19.3      13.6      TH55   IN 6
          609009        6086.5     84.4      82.2      80.1      77.8      75.6      TH55   IN 7
        73.2      70.8      68.2      65.5      62.5      59.7      56.4      52.7      TH55   IN 8
        48.6      44.2      40.2      35.8      31.2      26.1      20.7      15.0      TH55   IN 9
          609009        9088.3     86.2      84.0      81.9      79.6      77.4      TH55   IN10
        75.0      72.6      70.0      67.3      64.3      61.5      58.2      54.5      TH55   IN11
        50.4      46.0      42.0      37.6      33.0      27.9      22.5      16.8      TH55   IN12
          609009      12091.9     89.8      87.6      85.5      83.2      81.0      TH55   IN13
        78.6      76.2      73.6      70.9      67.9      65.1      61.8      58.1      TH55   IN14
        54.0      49.6      45.6      41.2      36.6      31.5      26.1      20.4      TH55   IN15
          609009      15093.4     91.3      89.1      87.0      84.7      82.5      TH55   IN16
        80.1      77.7      75.1      72.4      69.4      66.6      63.3      59.6      TH55   IN17
        55.5      51.1      47.1      42.7      38.1      33.0      27.6      21.9      TH55   IN18
          609009      18089.3     87.2      85.0      82.9      80.6      78.4      TH55   IN19
        76.0      73.6      71.0      68.3      65.0      62.5      59.2      55.5      TH55   IN20
        51.0      47.0      43.0      38.6      34.0      28.9      23.5      17.8      TH55   IN
COMMENT 611008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 611008 HELICOPTER - OH-58
AL        611008         086.0     83.9      81.8      79.7      77.5      75.2      OH58 OUT 1
        73.0      70.6      68.1      65.6      62.9      60.0      56.9      53.4      OH58 OUT 2
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        49.4    45.1     41.1    36.8    32.1    26.9    21.1    14.8    OH58 OUT 3
         611008        3087.9    85.8    83.7    81.6    79.4    77.1    OH58 OUT 4
        74.9    72.5     70.0    67.5    64.8    61.9    59.6    55.9    OH58 OUT 5
        51.8    47.0     43.0    38.7    34.0    28.8    23.0    16.7    OH58 OUT 6
         611008        6090.0    87.9    85.8    83.7    81.5    79.2    OH58 OUT 7
        77.0    74.6     72.1    69.6    66.9    64.0    60.9    57.4    OH58 OUT 8
        53.4    49.1     45.1    40.8    36.1    30.9    25.1    18.8    OH58 OUT 9
         611008        9088.5    86.4    84.3    82.2    80.0    77.7    OH58 OUT10
        75.5    73.1     70.6    68.1    65.4    62.5    59.4    55.9    OH58 OUT11
        51.9    47.6     43.6    39.3    34.6    29.4    23.6    17.5    OH58 OUT12
         611008       12089.7    87.6    85.5    83.4    81.2    78.9    OH58 OUT13
        76.7    74.3     71.8    69.3    66.6    63.7    60.8    57.1    OH58 OUT14
        53.1    48.8     44.8    40.5    35.8    30.6    24.8    18.5    OH58 OUT15
         611008       15088.0    85.9    83.8    81.7    79.5    77.2    OH58 OUT16
        75.0    72.6     70.1    67.6    64.9    62.9    58.9    55.4    OH58 OUT17
        51.4    47.1     43.1    38.8    34.1    28.9    23.1    16.8    OH58 OUT18
         611008       18088.0    85.9    83.8    81.7    79.5    77.2    OH58 OUT19
        75.0    72.6     70.1    67.6    64.9    62.9    58.9    55.4    OH58 OUT20
        51.4    47.1     43.1    38.8    34.1    28.9    23.1    16.8    OH58 OUT
COMMENT 612008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 612008 HELICOPTER - AH-1G
AL       612008         090.8    88.8    86.7    84.5    82.4    80.2    AH1G OUT 1
        77.9    75.6     73.2    70.7    68.1    65.3    62.3    58.8    AH1G OUT 2
        54.7    50.4     46.6    42.4    37.8    34.7    27.1    20.0    AH1G OUT 3
         612008        309[illegible].9    88.9    86.8    84.6    82.5    80.3    AH1G OUT 4
        78.0    75.7     73.3    70.8    68.2    65.4    62.4    58.9    AH1G OUT 5
        54.8    50.5     46.7    42.5    37.9    32.8    27.2    21.0    AH1G OUT 6
         612008        6094.1    92.1    90.0    87.8    85.7    83.5    AH1G OUT 7
        81.2    78.9     76.5    74.0    71.4    68.6    65.6    62.1    AH1G OUT 8
        58.0    53.7     49.9    45.7    41.1    36.0    30.4    24.2    AH1G OUT 9
         612008        9093.0    91.0    88.9    86.7    84.6    82.4    AH1G OUT10
        80.1    77.8     75.4    72.9    70.3    67.5    64.5    61.0    AH1G OUT11
        56.9    52.6     48.8    44.6    40.0    34.9    29.3    23.1    AH1G OUT12
         612008       12092.9    90.9    88.8    86.6    84.5    82.3    AH1G OUT13
        80.0    77.7     75.3    72.8    70.2    67.4    64.4    60.9    AH1G OUT14
        56.8    52.5     48.7    44.5    39.9    34.8    29.2    23.0    AH1G OUT15
         612008       15093.9    91.9    89.8    87.6    85.5    83.3    AH1G OUT16
        81.0    78.7     76.3    73.8    71.2    68.4    65.4    61.9    AH1G OUT17
        57.8    53.5     49.7    45.5    40.9    35.8    30.2    24.0    AH1G OUT18
         612008       18091.5    89.5    87.4    85.2    83.1    80.9    AH1G OUT19
        78.6    76.3     73.9    71.4    68.8    66.0    63.0    59.5    AH1G OUT20
        55.4    51.1     47.3    43.1    38.5    33.4    27.8    21.6    AH1G OUT
COMMENT 624008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 624008 HELICOPTER - UH-1H
AL       624008         091.5    89.4    87.3    85.2    83.0    80.8    UH1H OUT 1
        78.5    76.1     73.6    71.1    68.4    65.5    62.3    58.7    UH1H OUT 2
        54.6    50.3     46.4    42.2    37.6    32.6    27.2    21.5    UH1H OUT 3
         624008        3090.8    88.7    86.6    84.5    82.3    80.1    UH1H OUT 4
        77.8    75.4     72.9    70.4    67.7    64.8    61.6    58.0    UH1H OUT 5
        53.9    49.6     45.7    41.5    36.9    31.9    26.5    20.8    UH1H OUT 6
         624008        6093.1    91.0    88.9    86.8    84.6    82.4    UH1H OUT 7
        80.1    77.7     75.2    72.7    70.0    67.1    63.9    60.3    UH1H OUT 8
        56.2    51.9     48.0    43.8    39.2    34.2    28.8    23.1    UH1H OUT 9
         624008        9093.5    91.4    89.3    87.2    85.0    82.8    UH1H OUT10
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       80.5     78.1     75.6     73.1     70.4     67.5     64.3     60.7     UH1H OUT11
       56.6     52.3     48.4     44.2     39.6     34.6     29.2     23.5     UH1H OUT12
         624008      12097.1      95.0     92.9     90.8     88.6     86.4     UH1H OUT13
       84.1     81.7     79.2     76.7     74.0     71.1     67.9     64.3     UH1H OUT14
       60.2     55.9     52.0     47.8     43.2     38.2     32.8     22.1     UH1H OUT15
         624008      150101.2     99.1     97.0     94.9     92.7     90.5     UH1H OUT16
       88.2     85.8     83.3     80.8     78.1     75.2     72.0     68.4     UH1H OUT17
       64.3     60.0     56.1     51.9     47.3     42.3     36.9     31.2     UH1H OUT18
         624008      18099.1      97.0     94.9     92.8     90.6     88.4     UH1H OUT19
       86.1     83.7     81.2     78.7     76.0     73.1     69.9     66.3     UH1H OUT20
       62.2     57.9     54.0     49.8     45.2     40.2     34.8     29.1     UH1H OUT
COMMENT 607008 HOVER-OUT-OF-GROUND EFFECT
COMMENT 607008 HELICOPTER - CH-47
AL       607008        099.4      97.3     95.2     93.1     91.0     88.7     CH47 OUT 1
       86.4     84.1     81.6     79.0     76.3     73.3     70.1     66.4     CH47 OUT 2
       62.3     57.9     54.2     50.1     44.7     40.8     35.6     30.0     CH47 OUT 3
         607008        30100.6    98.5     96.4     94.3     92.2     89.9     CH47 OUT 4
       87.6     85.3     82.8     80.2     77.5     74.5     71.3     67.6     CH47 OUT 5
       63.5     59.1     55.4     51.3     45.9     42.0     36.8     31.2     CH47 OUT 6
         607008        60103.1    101.0    98.9     96.8     94.7     92.4     CH47 OUT 7
       90.1     87.8     85.3     82.7     80.0     77.0     73.8     70.1     CH47 OUT 8
       66.0     61.6     57.9     53.8     48.4     44.5     39.3     33.7     CH47 OUT 9
         607008        90101.     99.7     97.6     95.5     93.4     91.1     CH47 OUT10
       88.8     86.5     84.0     81.4     78.7     75.7     72.5     68.8     CH47 OUT11
       64.7     60.3     56.6     52.5     47.1     43.2     38.0     32.4     CH47 OUT12
         607008      120101.0     98.9     95.8     94.7     92.6     90.3     CH47 OUT13
       88.0     85.7     83.2     80.6     77.9     74.9     71.7     68.0     CH47 OUT14
       63.9     59.5     55.8     51.7     46.3     42.4     37.2     31.6     CH47 OUT15
         607008      15098.7      96.6     94.5     92.4     90.3     88.0     CH47 OUT16
       85.7     83.4     80.9     78.3     75.6     72.6     69.4     65.7     CH47 OUT17
       61.6     57.2     53.5     49.4     44.0     40.1     34.9     29.3     CH47 OUT18
         607008      180101.3     99.2     97.1     95.0     92.9     90.6     CH47 OUT19
       88.3     86.0     83.5     80.9     78.2     75.2     72.0     68.3     CH47 OUT20
       64.2     59.8     56.1     52.0     46.6     41.7     37.5     31.9     CH47 OUT
 EOI ENCOUNTERED.
C
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GLOSSARY

Acoustics Terms

There are several ways of measuring sound. Every sound has several characteristics. One of them is loudness. The human ear hears the loudness of a sound in proportion to the logorithm of the energy carried in the sound wave. Loudness is measured in decibels (dB) (which is logorithmic). Another characteristic of any sound is its pitch, how high and shrill or how deep and rumbling it is. Pitch is determined by frequency which is measured in Hertz (Hz) (cycles/second).

A-weighting: A filter for measuring noise (filters out noise below 1000 Hz, which people are less sensitive to).

AL Profile: A NOISEMAP3.4 instruction which gives A-weighted sound level at specified distances.

dB: Decibel, the unit used to measure loudness of sound.*

DNL: Day-Night Level**

Impulsiveness correction: A correction for the "thumping" character of noise made by adding a "penalty" to recorded level of noise.+

Ldn: Day-Night Levels**

Landing Ceiling: Altitude where NOISEMAP3.4 program starts computing extra noise generated during a flight descent.

SEL: Sound Exposure Level++

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*Loudness is a function of the energy in a sound wave. An individual's perception of loudness is logorithmic to the energy of the wave (e.g., twice as much as energy is perceived only slightly louder). The dB scale is logorithmic to correspond to human hearing.

**Day-Night Level is a system of correcting noise measurements for the extra annoyance caused by noise that disturbs sleep. A 10 dB penalty is added to all noises occurring at night. The nighttime penalties occur between the hours of 10:00 p.m. and 7:00 a.m.

+The impulsiveness correction factor (or penalty) is added to actual level of noise measured in dB if the noise is impulsive. Helicopter rotors are the main example of impulsive noise. The interaction of the rotors and the surrounding air causes a characteristic "thumping" sound.

++SEL is the amount of sound a person is exposed to during a given time interval. The time interval is usually short--no more than a couple of minutes. This measure of the noise level takes into account the time element (i.e., how long it takes to accumulate a given noise level).

Aviation Terms

In this report, the term "aircraft" generally refers to helicopters. Helicopters are different from airplanes in several important ways. First, a helicopter is more versatile than an airplane. It can ascend and descend at steeper angles; it can hover above a fixed spot; and it can make tighter turns. Second, a helicopter produces a different kind of noise than an airplane. The rotors on a helicopter often interfere with the noise it produces. This interference causes the characteristic thumping sound of a helicopter.

There are three ways to describe the turn an aircraft makes: (1) bank angle, (2) rate of turn, and (3) radius of turn. Any one of these parameters completely determines the curvature of the turn. The DRIVER program assumes that all turns last for 90 degrees, so the duration of the turn is not needed.

Angle of Ascent: angle between horizontal and path traveled during takeoff.

Angle of Descent: angle between horizontal and path traveled during landing.

AGL: Above Ground Level--distance between aircraft and ground.

Bank Angle: Angle between floor of aircraft and horizontal during a turn.

Ground distance: Length of horizontal component of aircraft flight path.

Ground path: Horizontal component of aircraft's flight path. Follows turns and maneuvers of aircraft.

Impulsive Noise: Noise due to interaction of rotors and airflow--characterized by abrupt changes in intensity.

Magnetic Declination: Angle between due north and magnetic north.

Rate of turn: Distance in degrees traveled around a circle in one second.

Reciprocal runways: Runways which are 180 degrees apart. Each physical runway is thought of as two reciprocal runways because aircraft can takeoff or land from either end.

Threshold displacement: Point of runway where aircrafts takeoff or land.* NOISEMAP3.4 considers this begins at 50 ft above airfield for landings.

Turn radius: Radius of a circle traveled by aircraft. The turn of any aircraft is the arc of some circle. The turn radius is the radius of this circle.

*Normally an airplane starts accelerating at one end of the runway to have enough speed at the other end to takeoff. In this case, the takeoff threshold displacement is 0. If the airplane starts gathering speed at some place other than the end of the runway, then that place is where the takeoff begins. In this case, the takeoff threshold displacement is the distance between the end of the runway and where the takeoff begins.

Computer Terms

The terms "card" and "instruction" have nonstandard definitions in this report. The user should read the definitions of these words before reading further (see list of terms below).

The NOISEMAP3.4 and DRIVER programs are available only on the Boeing Computing Services (BCS) network. It is assumed the user has access to BCS and knows how to sign on and off this system. There are three things users must know to make the computer work for them: program, data, and instructions directly to the computer. The program is a set of instructions telling the computer what to do with the data. The data is the information the user needs to begin the program. The user also needs the correct formatted program data to process the information into the computer. The direct instructions to the computer are stored in the "JCL" file. The JCL file tells the computer which program and data to access, and takes care of other details to make sure the user gets the required results.

For the program to work correctly, the data must be in a structured form. The computer will work in two modes--interactive or batch.

In interactive mode, the computer responds to each direct instruction as the user inputs the instruction directly from a terminal at his/her desk. The terminal has a keyboard similar to a typewriter. The computer follows the direct instruction and then asks for another instruction. Usually, when a user enters data interactively, he is using a screen-type editor and does not have a hardcopy output.

In batch mode, the computer follows a batch of instructions given all at one time. It does not ask the user what to do next. Batch mode is usually slower and less expensive. When a job is entered in a batch mode, the user's work is printed on "computer paper" to be saved for future reference.

Array: A group of variables with the same name which can have any number of subscripts, in theory; but many arrays have two subscripts. An array with two subscripts is thought of as a table. An individual variable is identified by a number called the subscript or index. For example, the following is a representation of an array named "A" with two subscripts. (In this example each subscript can go from 1 to 3.)

A(1,1) A(1,2) A(1,3)

A(2,1) A(2,2) A(2,3)

A(3,1) A(3,2) A(3,3)

Batch: A mode of running the computer. It is a slower and cheaper method which produces a physical copy of all work. Batch gets its name from the users providing a batch of "computer cards" to run any data series. Most users use batch mode to run the DRIVER and NOISEMAP3.4 programs, and the interactive mode to create the input and make modifications. In this report, it is assumed that the user will use the computer in this way.

Card: Contains one line of information that makes up the data, program, or output. "Card" is short for "card image." It is used because this was the original way of talking to a computer. Note that this is not exactly the standard definition of "card."

Column: A unit of measure used in the makeup of a card. A card consists of 80 columns. Each column contains a single character which runs from the top of the card to the bottom. It represents a single space on the line. Often a program will look in a particular column for a given piece of information; therefore, the column a number is in can make a big difference in what the computer thinks it means. For example, if a program looked for the number of oranges in columns 1 and 2, apples in columns 3 and 4, pears in columns 5 and 6, and peaches in columns 7 and 8, and the numbers were all moved one column to the right, then the program would interpret all the numbers incorrectly. If the card should read 12 oranges, 9 apples, 15 pears, and 7 peaches, and this information was entered one space to the right, the output would be 1 orange, 20 apples, 91 pears, and 50 peaches.

Correct card should look like this:

```
Column #   1 2 3 4 5 6 7 8 9 0
                   1 2   9 1 5   7
```

Incorrect card would look like this

```
Column #   1 2 3 4 5 6 7 8 9 0
                    1 2   9 1 5   7
```

Debug: A process of trying to locate an error before a program operates. Debug prints out information which the user usually doesn't want or need. The extra information shows the steps the program is going through and the user can find the general location of an error from the information the output produces. Once the user knows where to look he/she can usually find the error.

Field: A collection of adjacent columns. Usually a program looks for a particular piece of information in a particular place on a card. The information usually takes up more than one column. Each field has one piece of data in it. Often the fields are constant within a program.

File: Consists of a complete set of information stored inside a computer. Everything needed to run a program is stored together. Units that are referred to as separate units, such as the program, data, and output, are separate files. Files are the largest logical units that can be manipulated independently. Files are manipulated at the highest level of communicating with the computer (e.g., take the program in file A, run it on the data in files B and C, use file D for intermediate results, and store the results in file E).

Format: Specifies where particular information is located and in what form it is needed. Format is used primarily when discussing input or output. For example, specifying that the first piece of data is in columns 1 and 2, the second is in columns 3 to 6, the third to sixth pieces of

data are in fields 2 to 5, and that the first two pieces of data are integers and the other four are in exponential form is giving part of the input format. An example of output format is saying to print the phrase "The first result=", then the result using three places beyond the decimal. On the next line print "The second result=", then the result in integer form. On the next line print "The third result=", then the third result in exponential form. Formatting is necessary to insure the information the computer reads is the information the user intended and that the output has enough text to identify the results.

Index: Used to identify particular element of an array. An array is collection of similar pieces of information. If there are N elements, they are numbered from 1 to N. These numbers are the index to identify a particular element.

Instruction: A command to either the DRIVER or NOISEMAP3.4 program. The specific instruction is identified by a keyword in the first field of the first card of the instruction. Most instructions fit on one card; but in some cases, more than one card or variable is needed. Instructions are entered on a card to tell the computer what to do. Because it is easy to confuse the instruction with the card(s), two different words are used. In many places "card" is used for both "card" and "instruction." Note that "instruction" is not standard terminology.

Interactive: Another mode of running the computer. With interactive mode the computer "interacts" with the user. Commands are sent to the computer by using either a screen editor terminal or with a dial-up line printer terminal. The computer responds to the input and will ask the user for more information. Running the computer in interactive mode is faster and more expensive. Most users will use the batch mode to run DRIVER and NOISEMAP3.4, and the interactive mode to create the input and make modifications. This report was written as if the user used the computer this way.

JCL: Job Control Language. The computer uses these commands to operate the programs. It is the language for talking with the computer when it is not executing a program. The user needs a JCL file to control a job (e.g., to execute a program) in batch mode. JCL includes specific commands which are explained in the manual section.

Keyword: A word that signals the beginning of either a DRIVER or a NOISEMAP3.4 instruction. The DRIVER keywords (and associated instructions) are explained in detail in Chapter 4 of this report. There is a list of keywords at the beginning of that section.

Library: A way of storing information in a computer. A user can think of the information as stored in the following manner. Each area of information is stored separately in a separate library (e.g., in the DRIVER program, runway information is stored separately from flight description information). Each separate group of information is identified by its index number. The index number is assigned

explicity by the user when they give the information to the computer. Whenever the user needs any of this information, he/she asks for it by the index number. The size of the library limits the range of the index numbers. Usually a library is an array with two subscripts. The first subscript is the index number and the second identifies the particular piece of information.

Profile: An outline of information. It gives only the necessary information and ignores the details.

System Command: A command given to the computer when it is not executing a program. On the Boeing system, system commands are statements in the JCL. These commands include such activities as getting a data file, running a program, asking for the cost of the job, saving output, and changing the amount of time a job can use. System commands tell the computer what to do, whether in batch or interactive mode.

Terminal: The mechanism used to connect the user with the computer, whether it be by a screen-type terminal (CRT) or a teletype terminal. A CRT is similar in nature to an electric typewriter, except that a screen is used to produce the information typed into the computer rather than a paper output. A teletype terminal is much more like a typewriter because it has a paper output of all that is typed to the computer. Response from the computer is shown on either type of terminal.

DISTRIBUTION

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